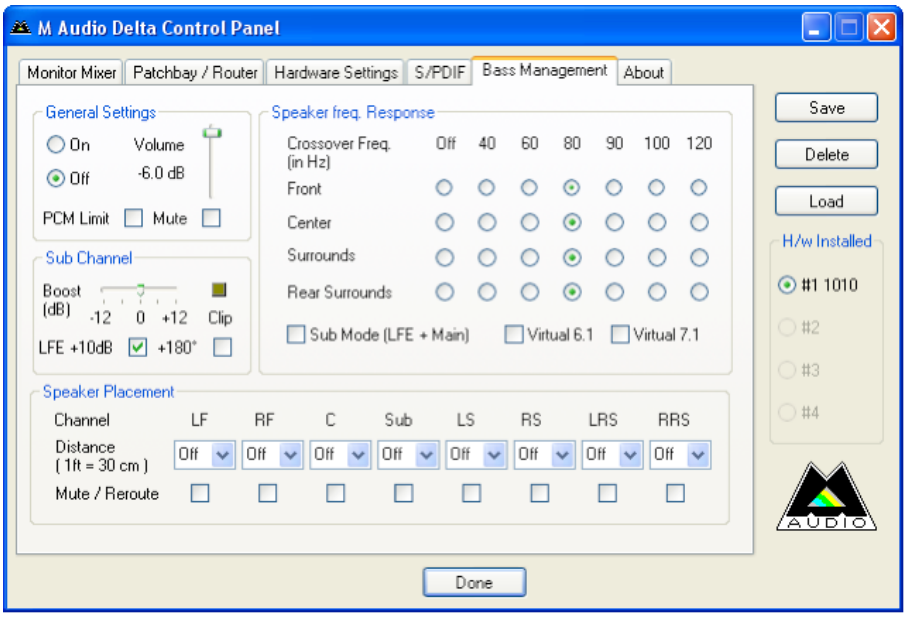
M-AUDIO

# Bass Management

## Users Guide

# Bass Management




## About Bass Management:

Bass Management is a tool that is used to help surround speaker systems (i.e., systems featuring multiple “satellite” speakers paired with a subwoofer) reproduce the full spectrum of sound from surround-encoded material. This is done by taking your multi-channel source and re-routing the low frequency sounds from each of the satellite channels to the subwoofer. Doing so ensures that low-frequency sounds are heard even if they were originally routed to smaller satellite speakers that are not capable of reproducing low frequency sounds.

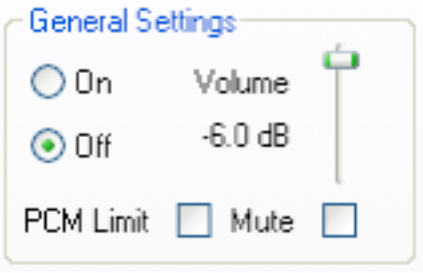
You will only need to take advantage of the Bass Management functions when using smaller satellite speakers that cannot reproduce low bass frequencies; If your main speakers are large enough to properly output low frequencies, Bass Management is not required and should remain off.

The M-Audio Bass Management system also includes several additional features that many users will find handy. These features include subwoofer loudness limiting (when adding rerouted main signal to the LFE, subwoofer phase inversion, and time-alignment on all channels.

*Each section of the Bass Management system is covered in detail below.*

# Bass Management

## The "General Settings" section sets global parameters for the Bass Management system.




- **On/Off** – Bass Management is only active when the "On" radio button is selected. If the "Off" radio button is selected, all parameters of the Bass Management system will be deactivated.

- **Volume** – This vertical slider adjusts the overall output level of all speakers at once. The output level of your interface is listed in "dB relative to full-scale" next to the fader. This means that the loudest possible output level (i.e., when the fader is at the top) is referred to as "0dB" and a signal that is, for example, 12dB lower than the maximum loudness is referred to as "-12dB."

- **PCM Limit** – When re-routing low frequency sounds from all of the satellite speakers to the subwoofer, it becomes possible to exceed the available headroom of the subwoofer channel. This will result in digital clipping (distortion). When the "PCM Limit" box is checked, the Bass Management system momentarily attenuates (reduces) the output volume when the signal exceeds the available digital headroom to prevent clipping.

- **Mute** – This box mutes the output of all the speakers when checked.

## The "Sub Channel" section contains volume and phase controls for the subwoofer channel.


- **Boost (dB)** – This horizontal slider can be used to increase or decrease the subwoofer loudness by up to 12 dB in relation to the main channels. This is used to fine-tune the subwoofer level in relation to the rest of your speakers.

- **LFE +10dB** – The subwoofer output is increased by an additional 10dB when this box is checked. The LFE output is left unaffected when the box is unchecked.

- **Clip** – The Clip indicator is located next to the Boost slider and turns red when output to the subwoofer is too loud and is "clipping" or distorting.

- **+180°** – This option inverts the phase of the signal sent to the subwoofer. Check the box to invert the subwoofer's signal; leave the box unchecked to let the signal pass unaffected.

***TIP:*** *When making any adjustments to the Boost controls, keep an eye on the Clip indicator. If it turns red, adjust the Boost slider setting until the subwoofer output no longer clips.*

***TIP:*** *Check this box for correct monitoring of Dolby Digital soundtracks. Leave the box unchecked while monitoring DTS encoded material, or if subwoofer output has been boosted at another point in the subwoofer's signal path.*

- ***To set the +180° checkbox:***

*First, leave the box unchecked and listen to your sound system. Next, check the box and continue listening. If you notice that the bass level increases when you check the box, leave the box checked. If the bass level decreases, then leave this box unchecked. If you hear no difference between the two settings, your speakers are placed in a way in which the setting of this box will not affect your monitoring system.*

# Bass Management

## The "Speaker freq. Response" section allows you to configure crossover points and routing options for your sound system.


- **Crossover Freq (in Hz)** – The Bass Management system re-routes low frequency sounds from main speaker channels to the subwoofer. These radio buttons allow you to set the "crossover" frequency at which the signal is split and sent to either the main channels (for use with satellite speakers) or subwoofer. For example, if "80" is selected (as shown in the picture), your interface will output frequencies above 80Hz to the specified main channels (where a smaller satellite speaker may be connected) while frequencies below 80Hz will be sent to the subwoofer. If the frequency is set to "Off," no bass re-routing will occur and the entire sound spectrum will be sent to the main channels.

- **Sub Mode (LFE+Main)** – When checked, the bass management system routes frequencies below your Crossover Freq (in Hz) selection to both the main channels and the subwoofer. In other words, frequencies below the crossover points are not removed from the main speakers before being sent to the subwoofer. This increases the bass output of your sound system since bass will be duplicated at the main speakers and the subwoofer.

***TIP:*** *Consult your speaker's documentation to see if an optimum crossover point is specified for bass managed systems. If the documentation does not include this information, locate the speaker's frequency response rating (most documentation will list this information in a "Technical Specifications" section) and set your crossover point just above the speaker's low frequency limit.*

*For example, if the speaker's frequency response rating is "65 Hz – 20 kHz +/- 3 dB" this means that the lowest frequency that the speaker is designed to produce is 65 Hz. Therefore, select the next highest radio button above 65 Hz, which is 80 Hz in the Bass Management tab.*

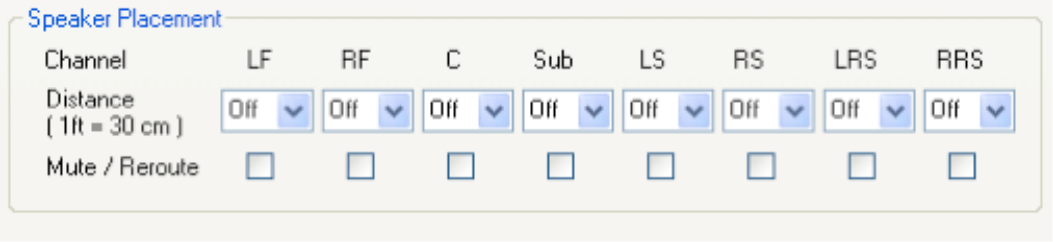
***TIP:*** *If you check this box and notice a reduction in bass levels or other phase-related issues (such as comb filtering), try changing the +180° setting in the Sub Channel section to see if the problem resolves.*

- **Virtual 6.1 and Virtual 7.1** – These two "virtual surround" checkboxes are for use when playing back 5.1 encoded surround material only. If you have a standard surround speaker set (consisting of 5 speakers and a subwoofer), leave these checkboxes empty. However, if your system has six or seven speakers and a sub (i.e., it is "6.1" or "7.1"), checking "Virtual 6.1" or "Virtual 7.1" will expand the original 5.1 source material to make use of all of your speakers.

***NOTE:*** *These checkboxes should be left unchecked if you are playing back true 6.1 or 7.1 sources such as Dolby Digital EX or DTS-ES encoded materials.*

# Bass Management

**The "Speaker Placement" section allows you to fine-tune your surround monitoring system by setting the distance from each speaker to your listening position.**




- Distance (1ft = 30 cm) – In an ideal surround listening situation, all of the speakers should be equally distant from the listening position. If some of your speakers (such as the surround channels), are farther away from you than the remaining speakers (the front satellites, for example), sounds produced from the surround speakers will not reach your ears at the same time as sounds from the front speakers.

  By selecting the speaker distances from the drop-down menus, the Bass Management system calculates the correct amount of delay compensation to add to each channel. This ensures that sounds from all speakers arrive at your ears at the same time.

  ***TIP:*** *You can also use this feature if your video display timing lags behind the audio. By increasing the speaker distance setting for all speakers, you should be able to re-align video and audio synchronization to your satisfaction.*

- Mute / Reroute – Checking these boxes will mute the associated speaker channel.

  If the center or subwoofer channels are muted, their audio signals will be re-routed to the left and right front speakers. This is a useful feature for mix engineers that would like to audition how a mix will sound on a system without a center channel or subwoofer.

  ***NOTE:*** *If the subwoofer channel is routed to the front speakers, the "Crossover Freq." for the front speakers must be set to "Off" for you to hear the low frequency sounds.*

M-AUDIO

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