LYNGDORF

LYNGDORF MP-40, MP-50, MP-60

SPEAKERS AND BASS MANAGEMENT GUIDE

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Setup of Speaker and Room

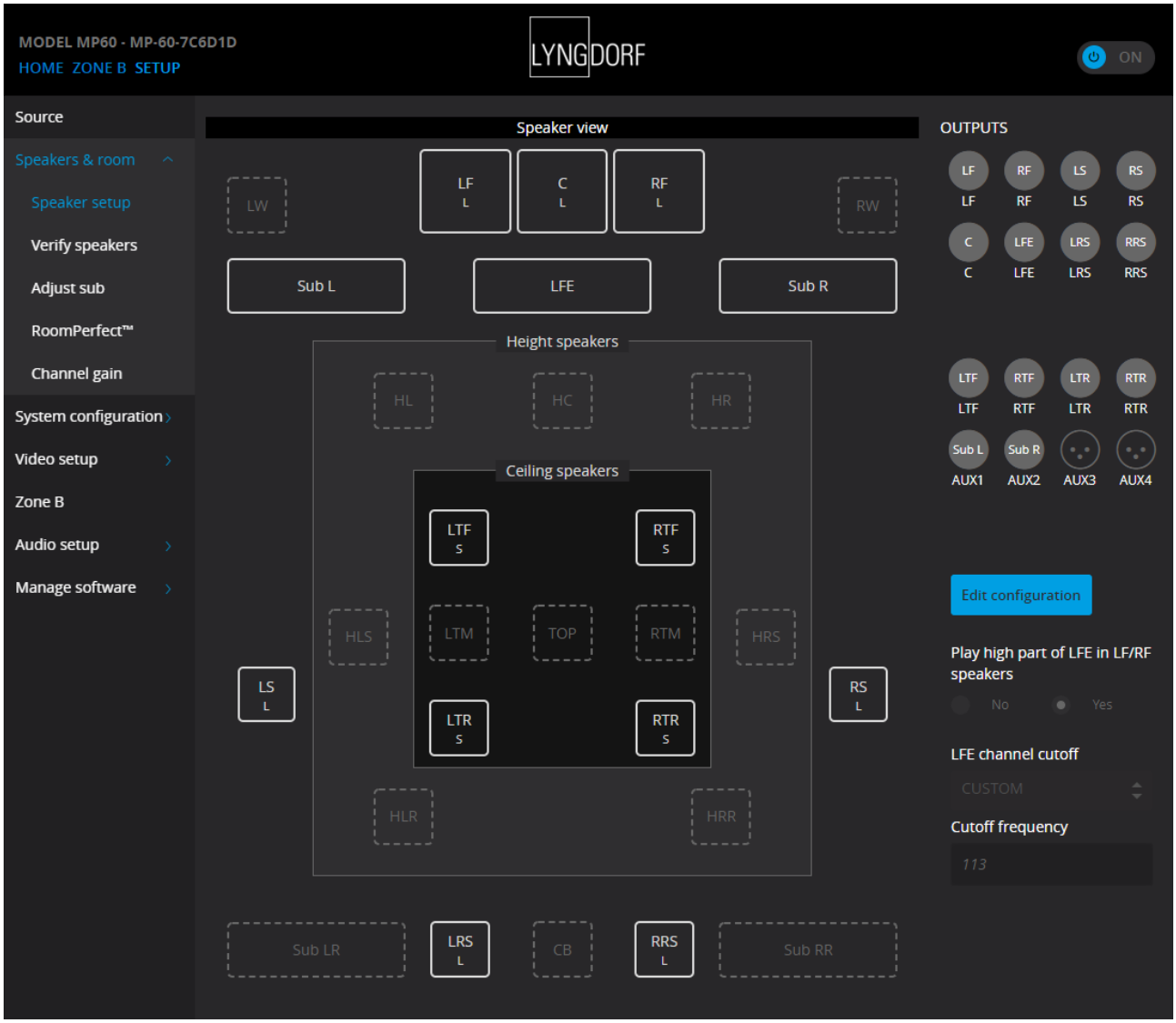
The purpose of the speaker setup is to inform the decoder and bass management processing which speakers and subwoofers are available. The functionality of the decoder is subject to change by their creators: Dolby, DTS and Auro, whereas the bass management is a proprietary design by Lyngdorf Audio.

Surround sound audio is comprised by dedicated audio tracks for low-level speakers (FL, C, RF, LW, RW, LFE, LS, RS, LRS and RRS) and for a 3D experience like Dolby Atmos audio effects are added as “objects” specified by their 3D coordinates in the room.

Lyngdorf Audio multi-channel processors (MP) are featuring 16 outputs for amplifiers and speakers: The 12 are fixed and designated to the basic 7.1.4 channel configuration plus 4 auxiliary outputs, which are designated to speakers and subwoofers defined in the Setup Menu.

The processors are specified having a capacity of decoding either 12 or 16 channels. A processor with 12 channel decoding will be able to output the full 7.1.4 configuration plus 4 channels created by the processor. These channels can be additional subwoofer channels, where the processors bass-management is combining the bass from speaker channels (and LFE) and mixing them into a stereo configuration. You can also activate Front Wide speakers or Top Middle speakers, and these outputs will then hold a mix of other outputs – Left Wide being a mix of Left Front and Left Surround, and the Left Top Middle would be a mix of the Left Top Front and Left Top Rear outputs. A processor with 16 channel decoding would create discrete Left Wide and Left Top Middle outputs.

Rear Panel:



In the web interface the channel designation for the AUX output will be grey text instead of white if the output is a mix of other channels.

Initial Setup Considerations

In order to get the optimal surround sound performance from your processor, you should consider, which audio format and post processing you want to perfect. In general minimum 5 low-level speakers must be installed, before you can add high-level speakers for a 3D surround sound experience.

Subwoofer(s)

- The bass performance is an essential part of the overall surround sound experience. Even with very large front speakers (LF-RF) the Low Frequency Effects (LFE) audio channel and bass-part of surround speakers will seriously stress your front speakers.
- A single subwoofer must be designated LFE. Position in the front corner is recommended.
- Using two subwoofers allows for a stereo setup for improved left to right panning. Positions in the front corners of the room is recommended. If two subwoofers cannot be positioned correctly for stereo, you should connect them both to the LFE output using a splitter.
- Three subwoofers will allow for having one as a dedicated LFE subwoofer and the remaining two in the front as Sub L and Sub R supporting the speakers with good stereo performance.
- Rear subwoofers can be added in order improve the experience in the back of a large room. The bass from the rear surround speakers will be directed to these subwoofers, which will improve both the left to right as well as the front to rear panning. Without a dedicated LFE subwoofer, the LFE audio track will be spread into all front and rear subwoofers.

PCM 5.1 / 7.1

- Include a Center Speaker in order not to require post processing for having the dialogue from the center channel mixed into the Left/Right speakers. Post processing will result in a reduction of the dynamics of the overall performance.
- With smaller front speakers, using two Subwoofers in a Left/Right configuration will improve the left/right panning and the overall stereo performance.

Dolby Surround

- A combination of high-quality, low-level surround speakers is essential for a good surround sound experience. Rather use the budget for a good basic surround sound system than spread the budget on a 3D setup with mediocre speakers.
- No matter WHERE these speakers are positioned in the room, these speakers MUST be specified as Center (C), Left and Right Surround (LS-RS) – and optionally Left and Right Rear Surrounds (LRS-RRS).

Dolby Atmos / DTS:X

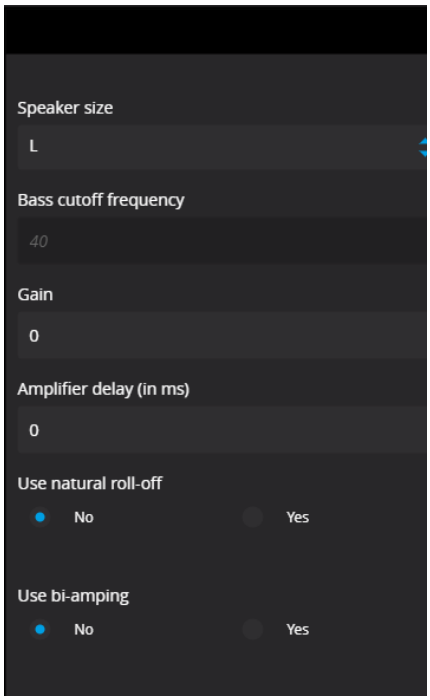
- If you want to add TWO high-level speakers in order to improve the 3D performance, you MUST specify these as Left and Right Top Middles (LTM-RTM). This will ensure that all the audio designed to be over your head will be routed correctly. Position of these speakers should be according to Dolby's recommendations for optimal performance.
- If you want to add FOUR high-level speakers, you MUST specify these as Left and Right Top Fronts (LTF-RTF) and Left and Right Top Rears (LTR-RTR) no matter how you actually position these speakers in the ceiling. Position of these speakers should of course be according to Dolby's recommendations for having the optimal experience.
- You will not have any benefit from adding a Top Speaker (TOP aka. Voice of God), as this speaker designation is not recognized by these decoders.

DTS:X is a format using up to 12 speakers in decoding and postprocessing. Processors with capacity of decoding/processing up to 16 speakers will be upgraded to handling the new format DTS:X PRO, as soon as the decoder is received from DTS.

AURO

- In order to have the optimal performance from the Auro decoder and post processing, the speakers should be positioned according the Auro recommendations and in this menu, they should be designated Height Speakers and optionally as Top Speaker.
- Position of these speakers should of course be according to Auro's recommendations for having the optimal experience.

Channel Specification



Speaker Size / Bass Cutoff Frequency

For all the speakers in the system, a size must be chosen. The speaker size informs the system how much bass the speaker can play by selecting a cutoff frequency. Signals below this frequency will then be redirected to another speaker or subwoofer in the system.

Available selections for speaker size are:

- None (The output is not active)
- XXL (Plays full range signal, bass cut from surround speakers as well as the LFE channel if no subwoofer is connected)
- XL (Plays full range signal)
- L (Cutoff frequency 40Hz)
- M (Cutoff frequency 80 Hz)
- S (Cutoff frequency 100Hz)
- XS (Cutoff frequency 120Hz)
- Custom (Opens the option for user selectable cutoff frequency)

Which cutoff frequency should you choose?

When selecting a cutoff frequency for your speakers, you should select a frequency higher than the lowest frequency your speaker is specified to play. This directs the bass from this channel to the subwoofer or a front speaker, if this is specified as XXL)

If the redirected bass will be played by a subwoofer, you should also make sure that the cutoff frequency is lower than the highest frequency the subwoofer can play.

The system can only redirect bass to XXL speakers placed at the Left Front/Right Front, Left Surround/Right Surround, and Left Rear Surround/Right Rear Surround positions.

In a system with subwoofers present, there will be no difference between XL and XXL, since the redirected bass is played by the subwoofers.

In a system with an LFE sub, the LFE sub will play the LFE channel, while the XXL speakers will play the redirected bass. (LFE is a separate channel for Low Frequency Effects)

In a system with no subwoofers at all, the XXL speakers will play the redirected bass as well as the LFE channel.

Normally a system without any subwoofers will need to have XXL speakers to receive LFE and redirected bass. There is, however, one exception; it is possible to make a system without subwoofers and with all XL speakers. Since there is no redirected bass, the system can handle this without XXL speakers, but in such a system, the LFE channel will not be played by any speakers.

LFE (Low Frequency Effects) Sub

According to the Dolby specifications, this channel should only contain audio up to 120 Hz. It is though occasionally holding audio with much higher frequencies, why it possible to select a Low Pass filter for this channel, if your subwoofer cannot reproduce these frequencies.
It is possible to add a cut-off for the LFE channel and you can choose to direct the higher frequencies to the Left and Right Front speakers if they have the capacity to perform this audio as well.
When setting up the LFE subwoofer, there is an option to select the size of the sub. This frequency is only used to add a low pass filter to the LFE channel. If the subwoofers are not playing LFE, then this setting has no effect. If subwoofers are playing the LFE, then the LFE channel will be low pass filtered before being sent to the subwoofers. This setting has no influence on the redirected bass since the filter frequency for that was selected when setting up the speakers.

Gain

For each speaker channel you can adjust the gain. This is used to roughly even out the levels of all speakers with relation to the gain in each amplifier channel and sensitivity and distance to the speaker. Use a sound pressure measuring application for your phone, while activating the Verify Speakers feature. This would only be for ensuring, that all speakers are within the optimal measurement levels, when RoomPerfect™ will perform the final calibration.

Note: The menu Channel Gains will reveal the gain settings from the RoomPerfect™ calibration, and you will be able to adjust the gain/level for each channel related to the type of audio decoded.

Amplifier Delay

The objective with this setting is to easily adjust for differences in delays through the connected amplifiers. This could be related to using Subwoofer(s) with digital processing, which employ an A/D plus a subsequent D/A conversion causing a delay to the signal passing. Adding a delay to a subwoofer output will result in the signal to all other outputs to be delayed accordingly.

Natural roll-off

When natural roll-off is used, the main speaker will receive the full range signal and will be allowed to roll-off naturally. The bass cutoff frequency will still be used to send a copy of the lowest bass to a subwoofer or XXL speaker.
This feature is used for speakers, which has an abrupt decline in its capacity for low frequencies, and you need to have the cross-over frequency very close to this lowest capacity, as having the cut-off filter on top of the abrupt natural decline would result in a poor integration with the subwoofer. The feature should NOT be used to increase the overall bass output, as having the same bass part played by two units simultaneously will result in serious phase problems and deteriorate the subsequent RoomPerfect™ calibration.

Bi-amping

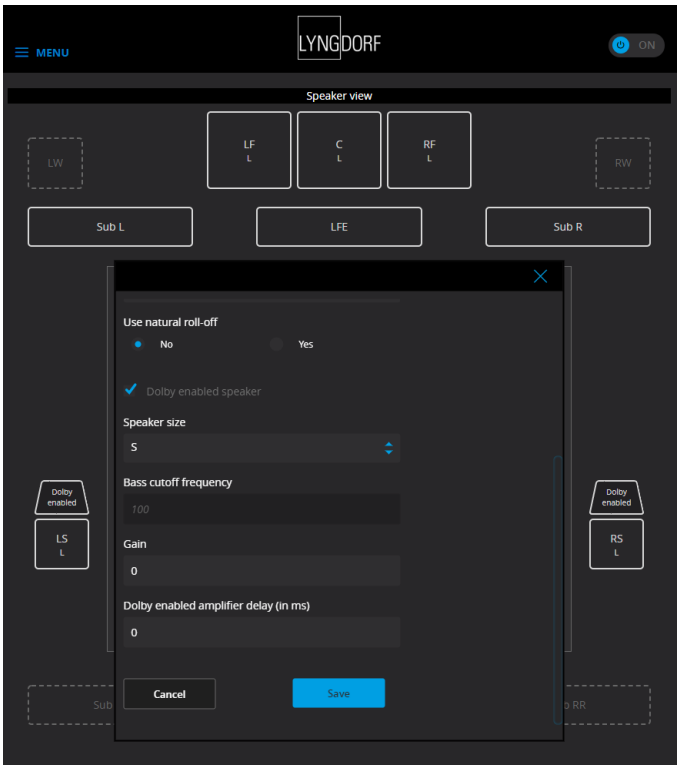
For the front speakers, it is possible to select an option to use bi-amping, in which the system will route a copy of the full signal for the left and right front speakers to a pair of the AUX outputs.

This signal is an exact copy of the existing signal for the front speakers. If the front speakers have been given a size with a cutoff frequency, that high pass filter is applied to both these outputs. This means it is possible to use bi-amping for speakers and still have bass management redirect the lowest bass to a subwoofer.

Dolby-enabled speakers

For Dolby Atmos setups, it is possible to add Dolby-enabled speakers instead of using top speakers mounted in the ceiling.

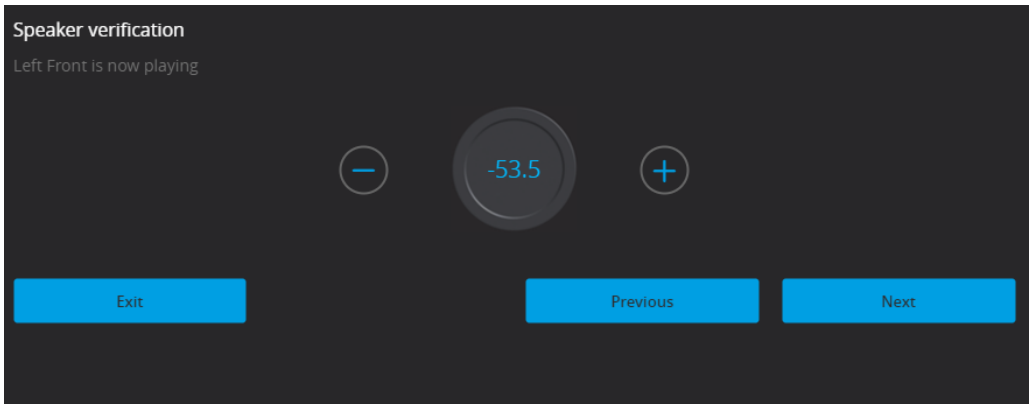
If you have Dolby-enabled speakers on top of your front and surround speakers, go to the settings for these speakers and activate the Dolby-enabled speaker option, and then select the corresponding size. The system will then find out which signal is to be routed for this speaker and will add an output for it.



Notice that playback of Auro-3D material will not make use of Dolby-enabled speakers.

Verify speakers

This menu allows you to do check the connections of speakers and amplifiers to the correct outputs of the processor.



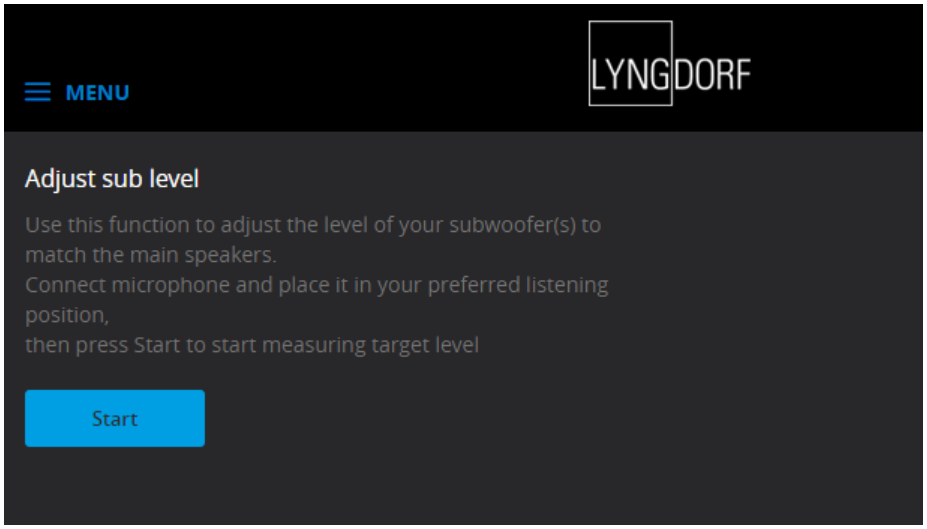
Adjust Sub

As the subwoofers are handling the bass information from multiple speaker channels, it is essential that the subwoofer(s) are aligned with each other and with the relevant speaker channels. Without alignment you risk having an inferior performance due to stress on the subwoofer's internal amplifier.

With one or more active subwoofer(s) connected to the MP-60, this menu will guide you into setting the volume level on each subwoofer's controls. Follow the instructions on the display to go through two phases:

1. Find the correct **system volume** to do the Subwoofer adjustment (tones through speakers)
2. Adjust the volume setting **on each subwoofer** for the RoomPerfect™ calibration.

Instructions on the screen.



Appendix / Assignment of speakers to bass positions

When XXL or front/rear subwoofers are used, the redirected bass from speakers will be distributed to the left or right side. When REAR subwoofers or XXL surround or rear speakers are involved, it will also be distributed between front and rear.

This table shows where each speaker has their bass directed to in these situations.

Position	Description	Left / right	Front / rear
L	Left	Left	Front
R	Right	Right	Front
C	Center	Both	Front
LS	Left surround	Left	Rear
RS	Right surround	Right	Rear
LRS	Left rear surround	Left	Rear
RRS	Right rear surround	Right	Rear
CB	Center back	Both	Rear
LW	Left wide	Left	Front
RW	Right wide	Right	Front
LTF	Left top front	Left	Front
RTF	Right top front	Right	Front
LTM	Left top middle	Left	Front
RTM	Right top middle	Right	Front
LTR	Left top rear	Left	Rear
RTR	Right top rear	Right	Rear
HL	Height left	Left	Front
HR	Height right	Right	Front
HLS	Height left surround	Left	Rear
HRS	Height right surround	Right	Rear
HC	Height center	Both	Front
TOP	Top ceiling / VoG	Both	Front

DTS/Dolby Atmos and Auro-3D

As the processor supports both Dolby Atmos as well as Auro-3D, the processor will be able to apply an Auro speaker setup, when playing a Dolby Atmos audio track.

The speaker designated to these two systems are:

Auro-3D:

- HL (Height Left)
- HC (Height Center)
- HR (Height Right)
- HLS (Height Left Surround)

- HRS (Height Right Surround)
- TOP (Top ceiling, also known as VoG / Voice of God)

DTS/Dolby Atmos:

- LTF (Left Top Front)
- RTF (Right Top Front)
- LTM (Left Top Middle)
- RTM (Right Top Middle)
- LTR (Left Top Rear)
- RTR (Right Top Rear)
- LW (Left Wide)
- RW (Right Wide)

If Dolby Atmos material is played in an Auro-3D setup, the decoders will try to match the Auro-3D specific speakers to the nearest Dolby Atmos equivalent; the same goes for playing Auro-3D material on a Dolby Atmos setup. You might experience that some speakers do

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Note: Some speakers might not be playing, when you play one format of audio on a speaker setup using the designations of another format.

Appendix / Comments on physical positioning of speakers and subwoofers

In order to have the optimal performance of your system you should position loudspeakers according to the latest guidelines from Dolby or Auro.

https://www.dolby.com/about/support/guide/speaker-setup-guides/

https://www.auro-3d.com/wp-content/uploads/documents/Auro-3D-Home-Theater-Setup-Guidelines_lores.pdf

As your multi-channel processor features the RoomPerfect™ calibration, you have more alternatives than with traditional calibrations:

Position normal box-speakers up against the walls

- This position will offer a better time-response (tighter bass) with the trade-off on the essential frequency-response. This is though what RoomPerfect™ will correct.

Subwoofers can be positioned in the corners of the room

- This position will offer better time-response (tighter bass) as well as improving the overall output with more than 6dB. RoomPerfect™ will subsequently integrate the subwoofer(s) with each speaker in order to have a perfect performance from each channel.

IMPORTANT NOTE:

We recommend that you ALWAYS make a backup of the processor settings and calibration after having adjusted settings and performed a RoomPerfect™ calibration.

You will then be able to switch between setups, to check the change to the performance.

Trademarks

Service Information

In order to obtain warranty service, you must contact your original dealer or the Lyngdorf Audio distributor of the region or country where you are located.