Dolby Atmos® Designer User's Manual

Issue 1

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Introduction

This manual shows you how to use the Dolby Atmos® Designer software to configure and tune an auditorium in a Dolby Atmos Cinema Processor CP850 playback environment, or a postproduction mix stage when using the Dolby® Rendering and Mastering Unit (RMU).

With Dolby Atmos Designer, you can tune your auditorium or mix stage using its automated equalization (AutoEQ) capability. This application provides tools for measuring the response of an auditorium or room and designing and implementing an equalization configuration. You can configure different target response curves, such as a flat response, the standard cinema x-curve, or a custom curve. Dolby Atmos Designer generates a Dolby Atmos configuration (.dad) file, which includes a room configuration and other data.

Note: You can open the .dad and .dac file formats using Dolby Atmos Designer. The CP850, RMU, and previous versions of Dolby Atmos Designer use the .dac file format. Using the CP850 or RMU web user interfaces (UIs), you can restore only a .dac file. You can open .dad files only with Dolby Atmos Designer.

Questions or Feedback

If you have questions or comments regarding this document or another related document, please contact technical publications.

If you have technical questions regarding this product/technology, please contact technical support.

Using Dolby Atmos Designer

This chapter provides step-by-step instructions for configuring and tuning an auditorium in a Dolby Atmos® Cinema Processor CP850 playback environment, or in a postproduction mix stage when using the Dolby® Rendering and Mastering Unit (RMU).

For a CP850, you install Dolby Atmos Designer on a PC or Mac®, as described in Section 2.3. When you connect to a Dolby Digital Cinema auditorium network that includes a CP850, you can run Dolby Atmos Designer in online mode. Dolby Atmos Designer runs in offline mode when disconnected from the auditorium network. In offline mode, you can enter information regarding an auditorium and save a .dad file. You can then reopen this file later to complete the process when you are online.

For an RMU, Dolby Atmos Designer is preinstalled on the system drive, and runs directly from the RMU.

Note: You can open the .dad and .dac file formats using Dolby Atmos Designer. The CP850, RMU, and previous versions of Dolby Atmos Designer use the .dac file format. Using the CP850 or RMU UIs, you can restore only a .dac file. You can open .dad files only with Dolby Atmos Designer.

This chapter includes the following information:

- Positioning Microphones
- Setting Up Audio Capture
- Installing Dolby Atmos Designer
- Launching Dolby Atmos Designer
- Designing a New Configuration
- Configuring a Room
- Configuring a Speaker Location
- Assigning Arrays
- Configuring the Speaker Assignments
- Configuring the Routing Parameters
- Configuring the Bass Management Parameters
- Entering the Room Information
- Configuring the Advanced Parameters (CP850 Only)
- Tuning the Room
- Viewing and Editing the Database

2.1 Positioning Microphones

To run Dolby Atmos Designer, you need the following equipment:

- Microphones (minimum of five, maximum of eight)
- Supported audio interface
- External sound pressure level meter

Begin the configuration by positioning your microphones:

1. Place microphone 1 at the reference position:
   - For an auditorium, place microphone 1 along the center line of the image at a point approximately two-thirds the length of the room.
   - For a mix stage, place microphone 1 along the center line of the image at the mixing console.
2. Place microphones 2–8 at different positions within the room so that they cover the middle to rear portion of the seating area. (Use the following guidelines, and refer to Figure 2-1.) If possible, avoid the following:
   - Do not place microphones 2–8 at points of symmetry. That is, avoid placing microphones half the distance between walls (antinode for all harmonics), one-third the distance between walls, or one-quarter of the distance between walls.
   - Two microphones in the same node structure: Do not place microphone pairs with front/back or left/right symmetry. That is, avoid placing two microphones at the same distance from a parallel wall. (For example, if one microphone is placed 15 feet from the left wall, do not place a second microphone 15 feet from the right wall.)
   - Do not place microphones close to wall surfaces, hard partitions, equipment credenzas, or other surfaces that could cause errors in the measured frequency response due to sound reflections.
   - Do not place microphones in close proximity to an individual loudspeaker.

Figure 2-1 shows typical auditorium and mix stage microphone setups.

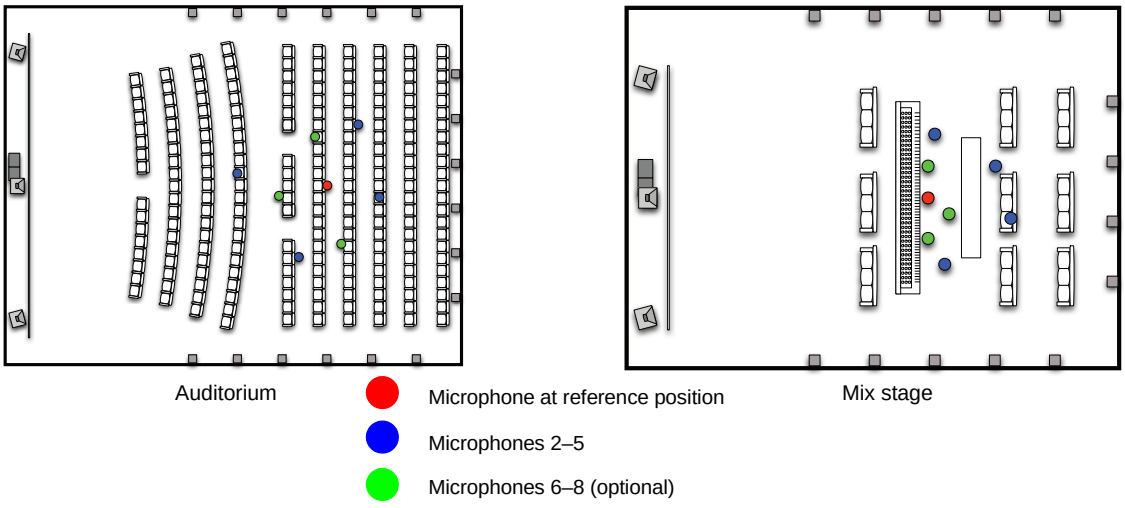


Figure 2-1 Typical Microphone Setups

Microphone Angle and Elevation

Take the following precautions when positioning the angle and elevation of your microphones:

1. Position each microphone near the typical ear height of a seated person (four feet, or 1.2 meters), but with enough distance from the seat or mixing console to prevent frequency response errors due to sound reflections. Typically, this is six inches or 15.24 centimeters above a seat in a cinema or screening room.
2. Orient each microphone so that the sound arrives along the axis where the microphone exhibits the flattest frequency response.

   For example, point each microphone at a 45° angle toward the screen speakers when using Beyerdynamic MM 1 microphones with serial numbers greater than 2000. However, when measuring surround and overhead speakers, point each microphone straight up toward the ceiling, due to the different incident angles to the microphones.

Caution: High-back chairs can prevent you from placing a microphone near the ear height of a seated person. In such a case, elevated seated ear height is desirable to avoid frequency response errors that result from sound reflecting off the seat.

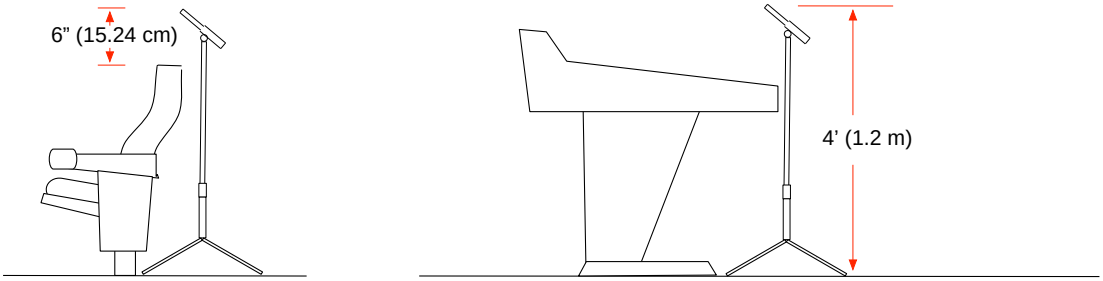


Figure 2-2 Microphone Relative to Seated Person Ear Height

2.2 Setting Up Audio Capture

You continue the room configuration by setting up audio capture using the appropriate audio interface:

- For a CP850 auditorium environment, use the Roland® Octa-Capture high-speed USB audio interface.

Note: For Microsoft® Windows®, you must set the Octa-Capture audio buffer size to 512 for the driver settings.

- For an RMU mix stage environment, use the RME Micstasy audio interface.

The following figure shows you how to set up audio capture in a CP850 auditorium or an RMU mix stage. For detailed instructions, see the documentation included with your respective equipment.

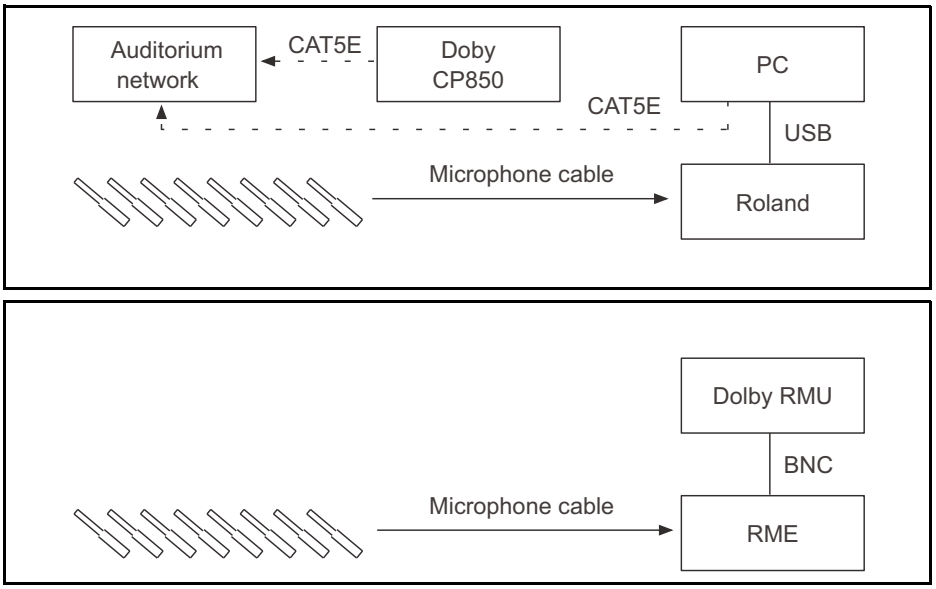


Figure 2-3 CP850 and RMU Audio Capture Configurations

2.3 Installing Dolby Atmos Designer

For a CP850, you must install Dolby Atmos Designer on your Microsoft Windows or Apple® Macintosh® system. For an RMU, Dolby Atmos Designer is preinstalled on the RMU system drive.

Note: The CP850 requires software version 2.1.0.10 or later, while the RMU requires software version 1.6 or later.

The Dolby Atmos Designer software runs on Microsoft Windows 7 and 10, and Apple Mac OS® X® v10.9, v10.10, and v10.11. VMware® is not supported. To install Dolby Atmos Designer on a Mac or PC:

1. Download the Dolby Atmos Designer software from https://www.dolbycustomer.com. You will need to set up a user ID and password to access this website. You can also download periodic software updates here.
2. Double-click on the **Dolby Atmos Designer** icon to begin the installation process, then follow the screen prompts.

2.4 Launching Dolby Atmos Designer

To launch Dolby Atmos Designer on a PC, click **Start** > **Dolby Atmos Designer**. On a Mac, double-click the Dolby Atmos Designer icon. A new untitled project opens with a menu bar at the upper-left side of the screen. You can access the **populate**, **define**, **tune**, and **manage** parameters by clicking on the respective buttons in the navigation bar at the left side of the screen.

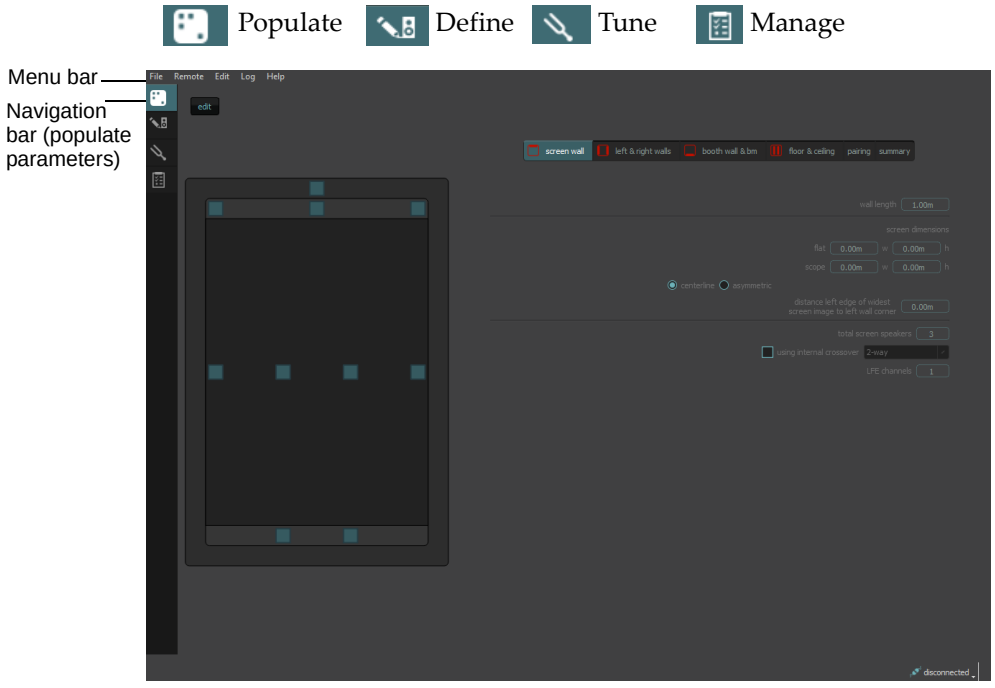


Figure 2-4 Dolby Atmos Designer New Project (Populate Parameters)

The first parameters to appear are the populate parameters, as indicated by its highlighted button in the navigation bar. This is where you begin a new configuration design. By default, only buttons appear in the navigation pane. Optionally, you can expand the displayed area to view button labels that identify the respective parameters. The instructions in this manual show the navigation bar in the default button-only view.

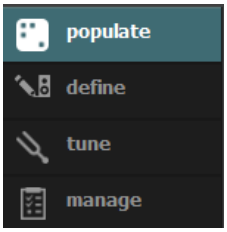


Figure 2-5 Navigation Bar in Expanded Window with Button Labels

2.4.1 Using the Menu Bar

The menu bar at the upper-left side of the screen provides multiple menu options.

Windows Mac

Figure 2-6 Menu Bar

File Menu

When you click **File** in the menu bar, you can start a new configuration, open an existing configuration from your local disc, save your configuration settings, perform database functions, import Dolby Atmos Designer profiles, and exit Dolby Atmos Designer. (On a Mac, there is a **Quit** option in the Dolby Atmos Designer menu instead of the **Exit** option, as shown in Figure 2-11.) For information on the database functions and .dad profiles, see Section 2.6.

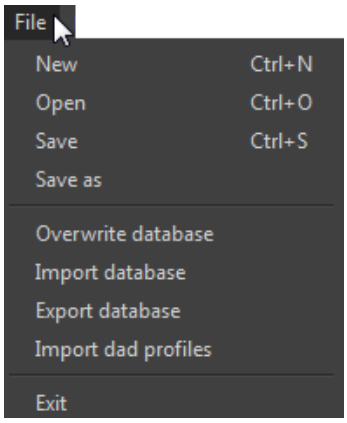


Figure 2-7 File Menu

Remote Menu

When you click **Remote** in the menu bar, you can connect to the CP850. You can also pull or push a configuration (for both the CP850 and RMU).

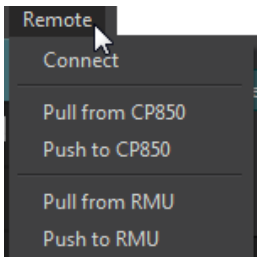


Figure 2-8 Remote Menu

Edit Menu

When you click **Edit** in the menu bar, you can access the **Preferences** parameters. On a Mac, you can access these parameters in the Dolby Atmos Designer menu. (See Figure 2-11 and Figure 2-11.)

Log Menu

When you click **Log** in the menu bar, you can show and clear logs.

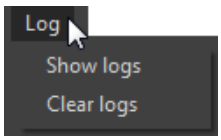


Figure 2-9 Log Menu

Help Menu

When you click **Help** in the menu bar (Windows), you can display Dolby Atmos Designer software information. On a Mac, you can access this information in the Dolby Atmos Designer menu.

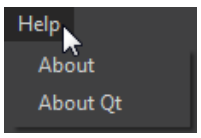


Figure 2-10 Help Menu

2.5 Designing a New Configuration

To design a new configuration:

1. If Dolby Atmos Designer is not running, launch it.
   A new untitled project opens.
2. Click **Preferences** in the **Edit** menu (Windows), or in the Dolby Atmos Designer menu (Mac).
   On a Mac, also note the **Quit** option (instead of **File** > **Exit**, as in Windows).

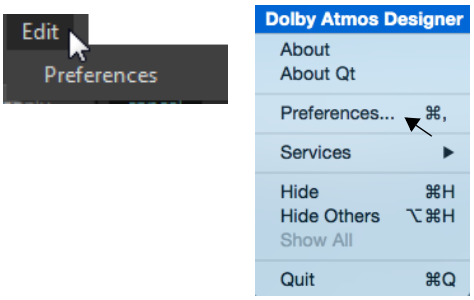


Figure 2-11 Select Preferences

The **Preferences** screen appears. In this screen, you can select your audio device, and specify your measurement units (meters or feet). In addition, you can view database information and perform database functions. If you write custom notes when exporting a database, the database notes appear in this screen. For information on the database functions and .dad profiles, see Section 2.6.

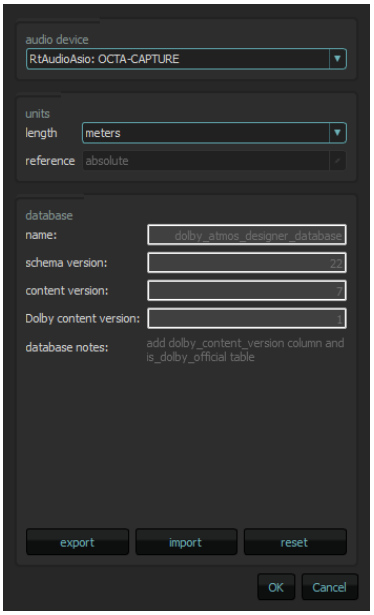


Figure 2-12 Preferences Screen

3. Enter your preferences, then click **OK** or click **Cancel** to undo your entries.

2.5.1 Configuring a Room

To configure your room:

1. Click the **populate** button at the left side of the screen, and then click the edit button.

Figure 2-13 Click Edit to Enter Parameters

The populate screen is now activated. In this screen, you configure the wall, floor, and ceiling parameters by making entries in the respective fields for each area in your room. Figure 2-14 shows the **screen wall** parameters, which is the first set of populate parameters to appear, as indicated by its highlighted tab screen wall. The tab for the active parameter is always highlighted. Before you enter valid parameters, the wall, floor, and ceiling populate tabs include a small red icon. After configuring valid parameters, the icons change from red to green, as shown in Figure 2-21.

Note: The **using internal crossover** parameter is not applicable when configuring a mix stage using the RMU.

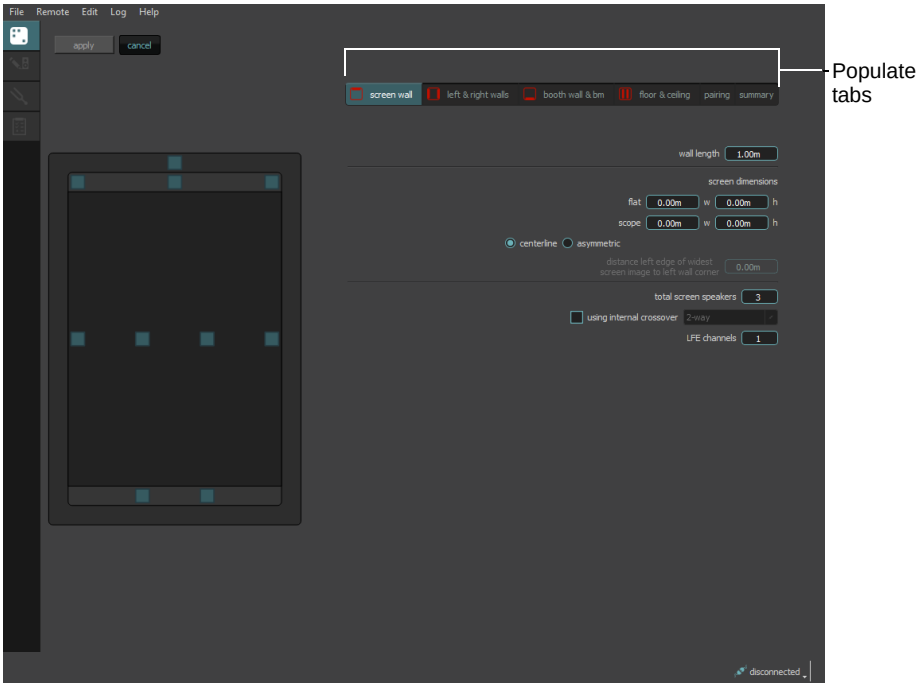


Figure 2-14 Populate Parameters (Screen Wall)

2. Enter the desired parameters for the screen wall.

   To enable the use of internal crossovers (CP850 only), your unit must have the required enablement installed. For information on obtaining enablements, refer to the *Dolby Atmos Cinema Processor CP850 Manual*.

   If your CP850 is enabled for internal crossovers, you can click the **using internal crossover** box and then select **2-way**, **3-way**, or **4-way** in the drop-down menu, as shown in Figure 2-15. Crossovers are indicated by an icon.

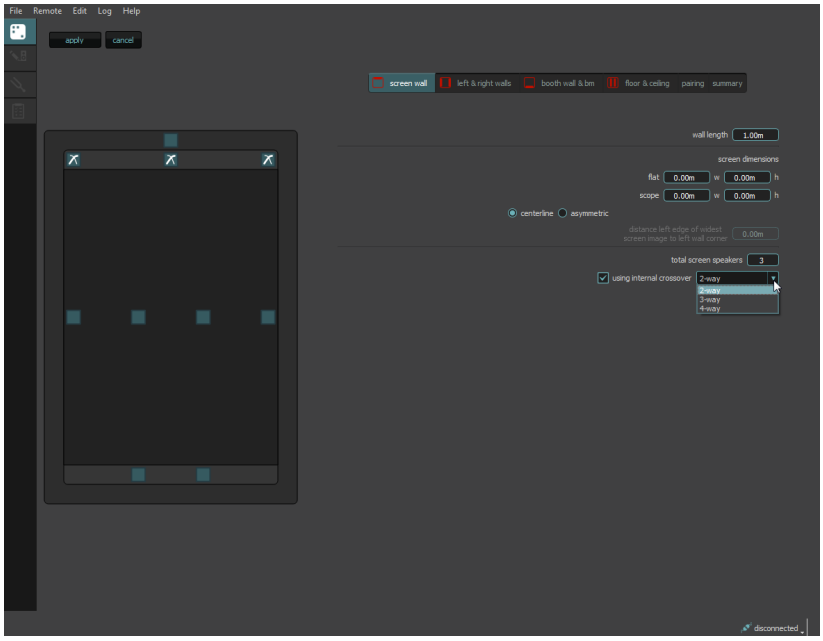


Figure 2-15 Configuring Crossovers (CP850 Enabled Units Only)

In this screen and in all of the populate screens, you can click the **apply** button at the upper-left corner to confirm your settings and all the screen tab icons turn green (see Figure 2-21), which indicates that you entered complete and valid data. However, you can wait until you enter information in all of the populate screens and then click the **apply** button.

To undo your settings, click the **cancel** button . This button changes to a **discard** button and you have an option to apply or discard your settings.

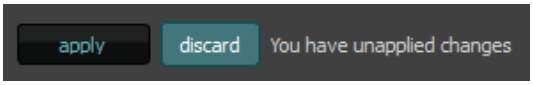
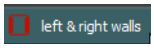


Figure 2-16 Apply or Discard Settings After Clicking Cancel

Note: If you enter and apply settings and then exit (or quit) Dolby Atmos Designer, a prompt appears asking whether you want to save your configuration.

3. Click the **left & right walls** tab 

to enter the respective parameters, as shown in Figure 2-17.

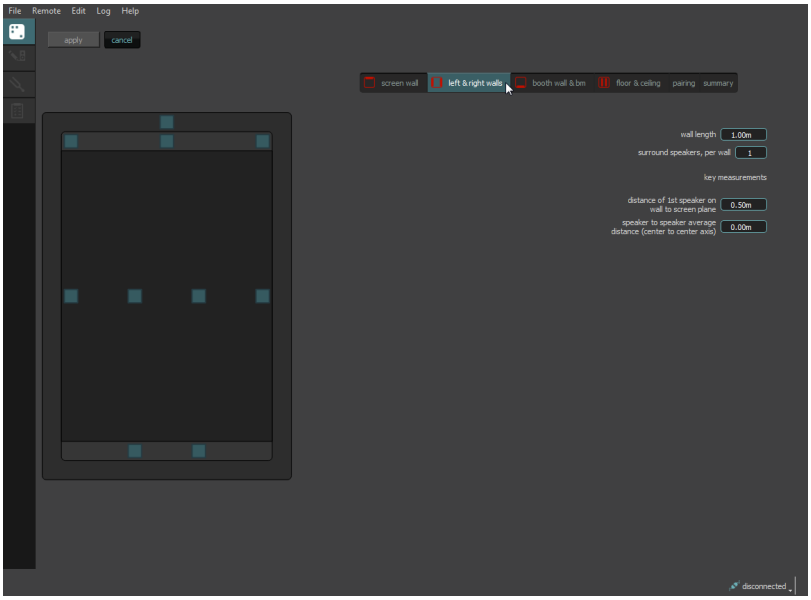
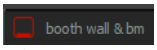


Figure 2-17 Left and Right Walls Parameters

4. Enter the desire left and right wall parameters in the respective fields.

5. Click the **booth wall & bm** tab 

to enter the parameters for the booth wall and bass management subwoofers.

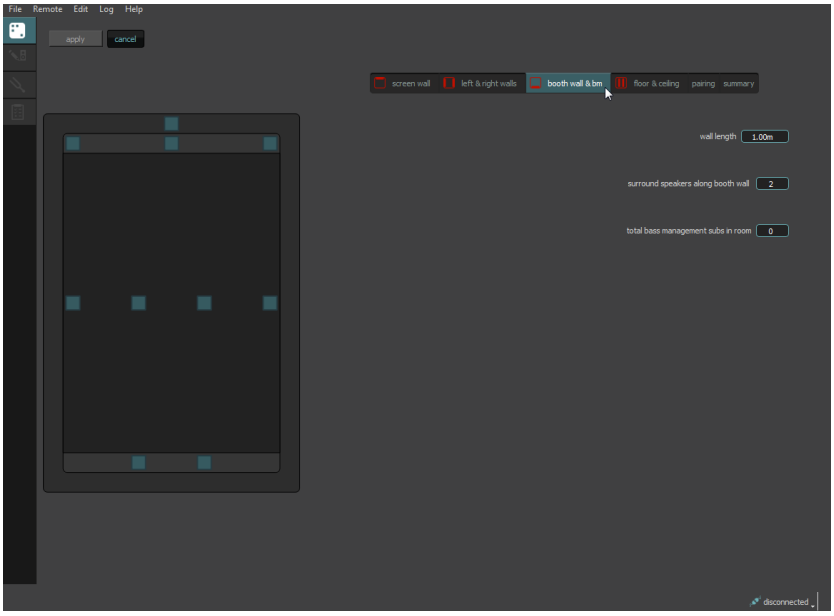
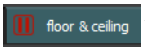


Figure 2-18 Booth Wall and Bass Management Parameters

6. Click the **floor & ceiling** tab 

to enter the respective parameters.

   If the floor is flat, retain the default floor settings (0.000 m). If the ceiling is flat, enter the ceiling elevation at the screen for all three values.

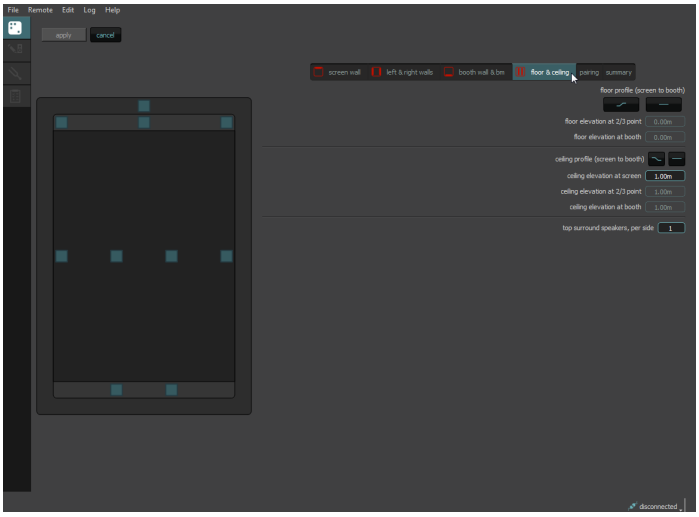


Figure 2-19 Floor and Ceiling Parameters

If you want to use the pairing feature, click the pairing tab

. You can pair loudspeakers within the same zone and region (driven by a single signal) to jointly optimize for uniform coverage, power efficiency, spatial resolution, and system complexity. The signals are distributed to each loudspeaker without phase, level, or delay differences, and can be driven by a single amplifier channel.

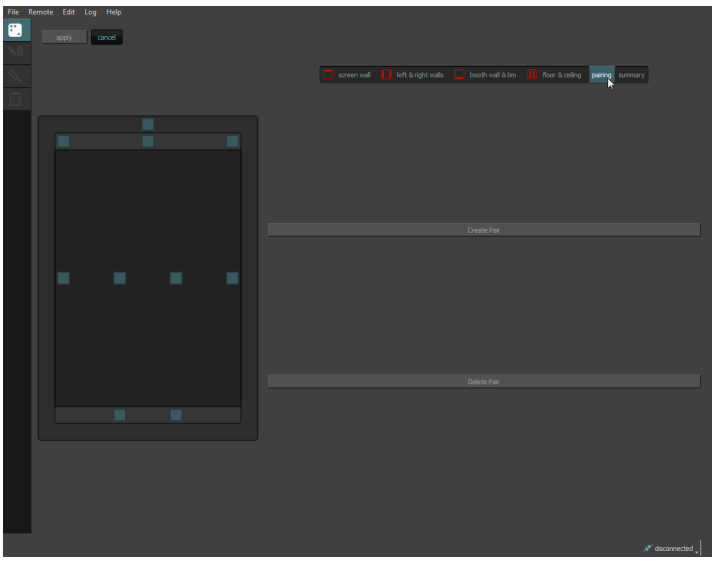


Figure 2-20 Pairing Parameters

Caution: Adding a pair in a previously configured room clears all the routing, speaker assignment, and bass management parameters.

7. Click the **apply** button to confirm all of your populate entries, or click the **cancel** button to undo your entries.
8. To save your entries, click **save** in the **file** menu, then follow the onscreen instructions to name and save your file to the desired location, and click **yes** in the confirmation dialog. To display a summary of your entries, click the **summary** tab.

   If you enter valid parameters, the respective icons change to green. If any of your parameters are invalid, their icons are red and an error message appears. In such a case, you must enter valid settings. Clicking **edit** allows you to change any of your previously saved parameters.

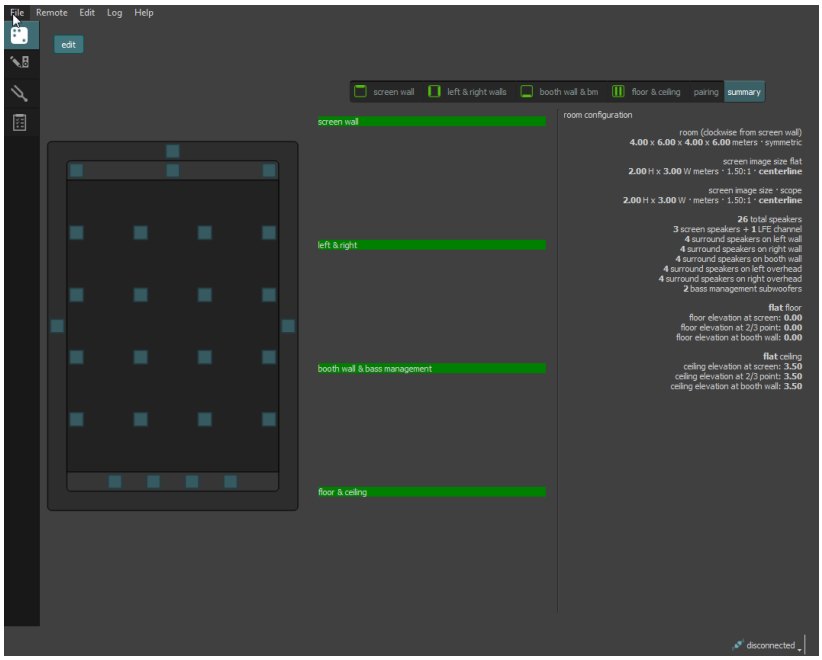


Figure 2-21 Summary of Valid Parameters

2.5.2 Configuring a Speaker Location

To configure a speaker location:

1. Click the **define** button in the navigation bar at the left side of the screen to display the corresponding parameters.
   The speaker position parameters appears first, as indicated by the highlighted define **speaker** tab speaker.

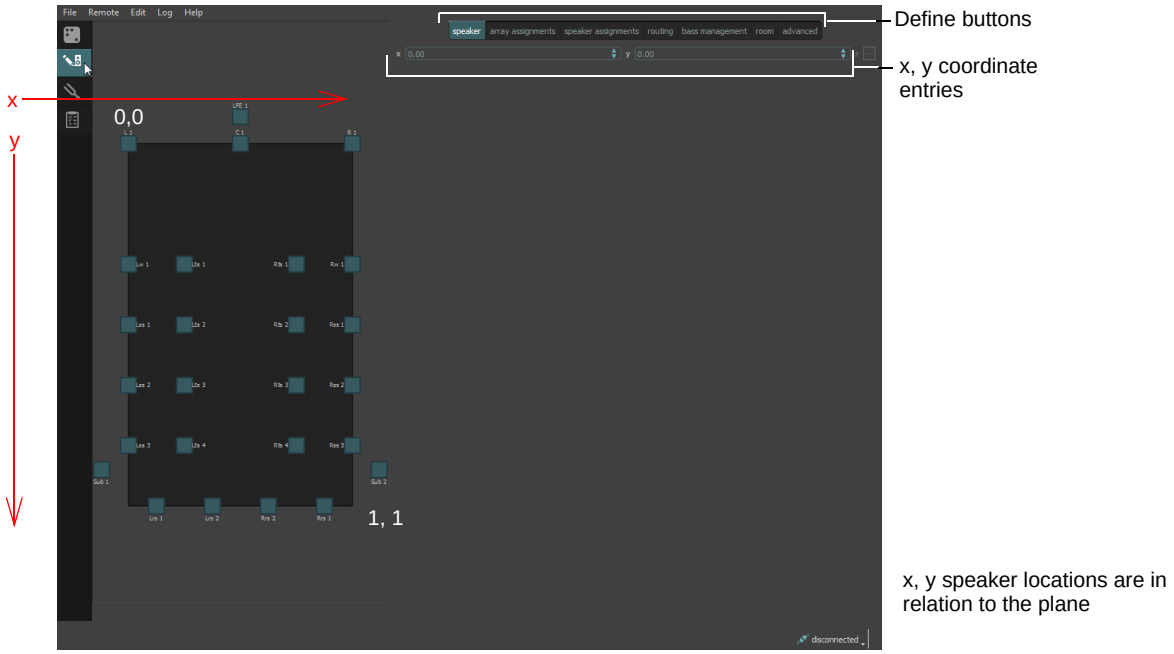


Figure 2-22 Configure Speakers

2. Click on a speaker icon at the left side of the screen.
3. Enter the **x** or **y** coordinates for the speaker locations in the respective fields:
   - The **x** and **y** coordinates for the screen speakers are fixed (read only).
   - The **x** coordinates for the left and right wall speakers are fixed.
   - The **y** coordinates for the booth wall speakers are fixed.
   - The **z** coordinates for the overhead speakers are fixed.

2.5.3 Assigning Arrays

To assign arrays:

1. Click the **define** button in the navigation bar at the left side of the screen, then click the define **array assignments** tab array assignments.

   The **array assignments** appear. Dolby Atmos Designer automatically assigns speaker feeds to the arrays based on predefined rules. In this screen, the colors of the speakers correspond to their array assignments.

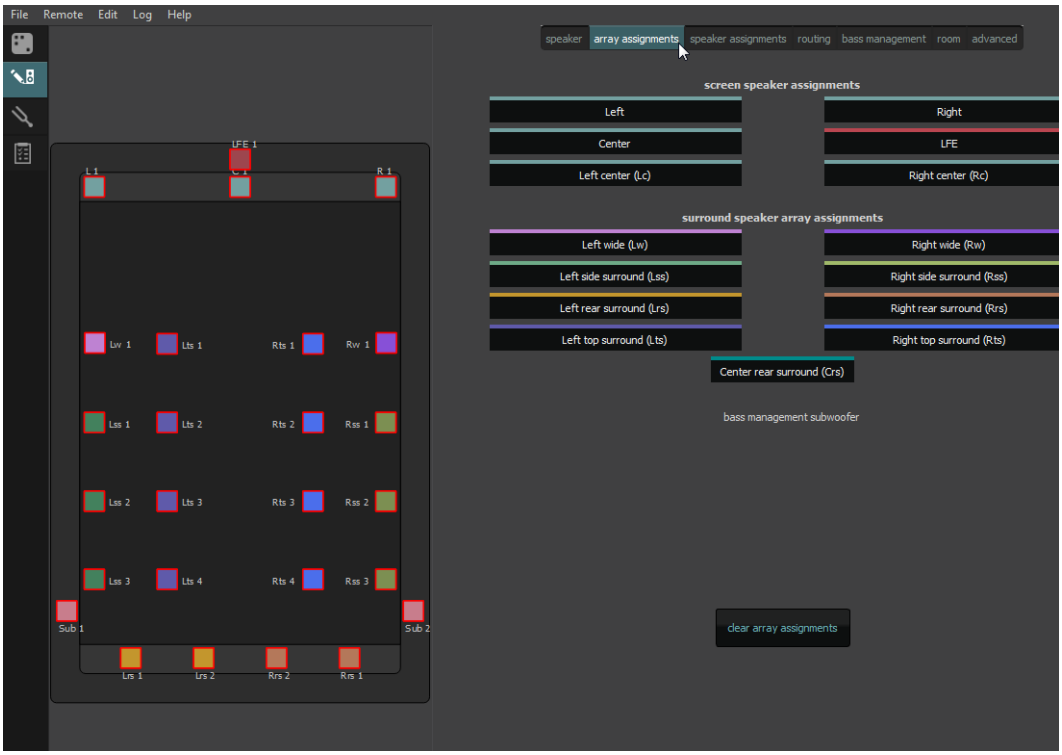


Figure 2-23 Array Assignments

2. To change the speaker assignments:
   - Click on a speaker to outline it with dashes.
   - Click the desired speaker assignment button.

   To undo your array assignments, click the **clear array assignments** button clear array assignments at the lower-right side of the screen.

Figure 2-24 shows a configuration with five subwoofers (one Low-Frequency Effects [LFE] channel designated by a icon, and four bass management subwoofers designated by icons). Also shown are three crossovers designated by icons.

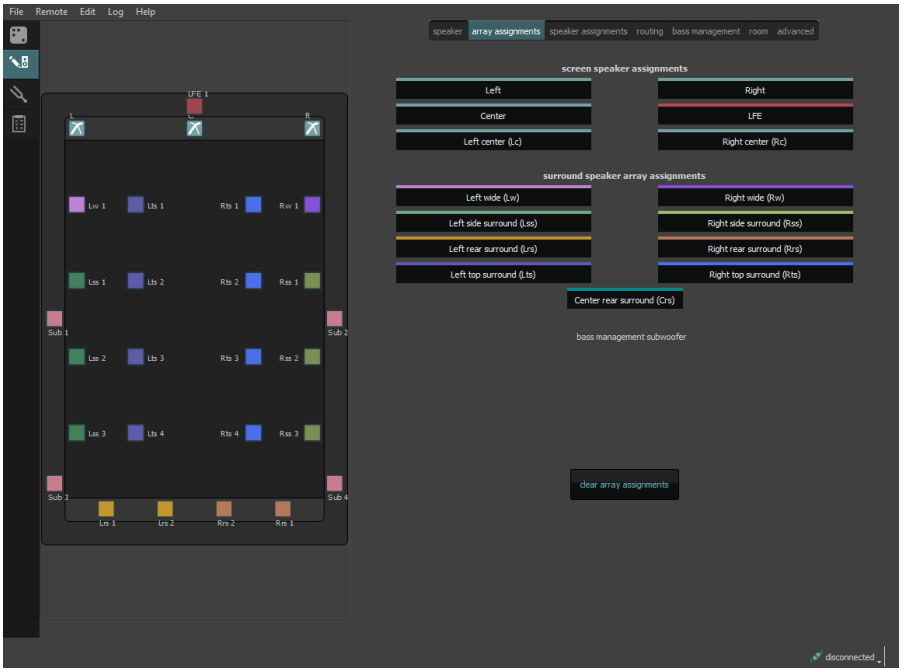


Figure 2-24 Array Assignments (Five Subwoofers)

2.5.4 Configuring the Speaker Assignments

To configure the speaker assignments:

1. Click the **define** button in the navigation bar at the left side of the screen, then click the define **speaker assignments** tab speaker assignments.
2. The **speaker assignments** appear.

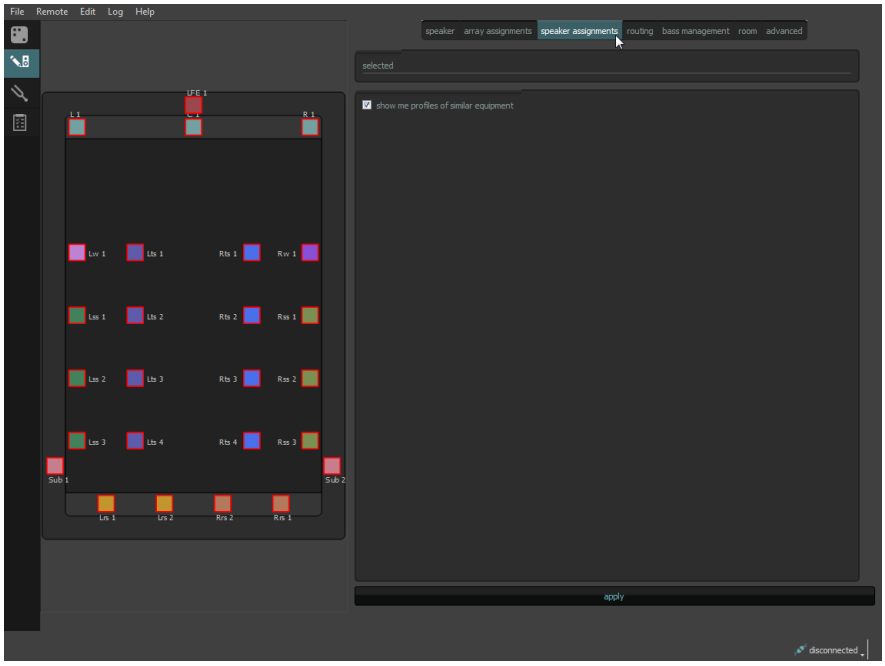


Figure 2-25 Configure Speaker Assignments

3. To select a speaker, click on its icon at the left side of the screen. You can also draw a marquee around a group of speakers of the same type (for example, surrounds) and edit the parameters for that group, except when you enter the x and y coordinates for a speaker location (as described in Section 2.5.2).

   If you click on a speaker to select it, a dashed outline appears around the speaker. To add or remove the same type of speaker, press <Ctrl> on a PC (or <Command> on a Mac) while you click on it. Red outlines displayed around a speaker indicate an unconfigured speaker, or a speaker missing critical information. In addition, error messages may appear in red near the bottom of the screen (for example, when a parameter value is not within the proper range).

Caution: Changing the configuration in a previously acquired room clears all acquisitions, speaker assignment, routing, and bass management parameters.

4. To assign a speaker profile, click in the **change type** field to display a drop-down menu.
5. Select **generic**, **passive**, **active**, **external processor** (for screen speakers and subwoofers), or **internal crossover**. For the RMU, the **external processor** and **internal crossover** parameters are not applicable.

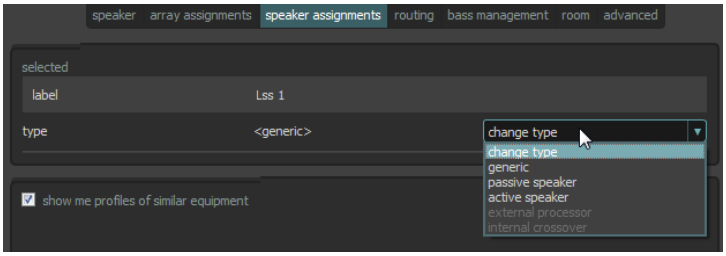


Figure 2-26 Change Speaker Type

When you select **passive**, two fields appear where you can select a speaker and amplifier from the respective drop-down menus, as shown in the following figure. For **active**, only a speaker field appears. The speaker and amplifier profile database is prepopulated with read-only profiles. If your speaker model is not in the database, you can add a profile and edit it accordingly, as described in Section 2.6. Some speaker locations are fixed (read only), as described in Section 2.5.2.

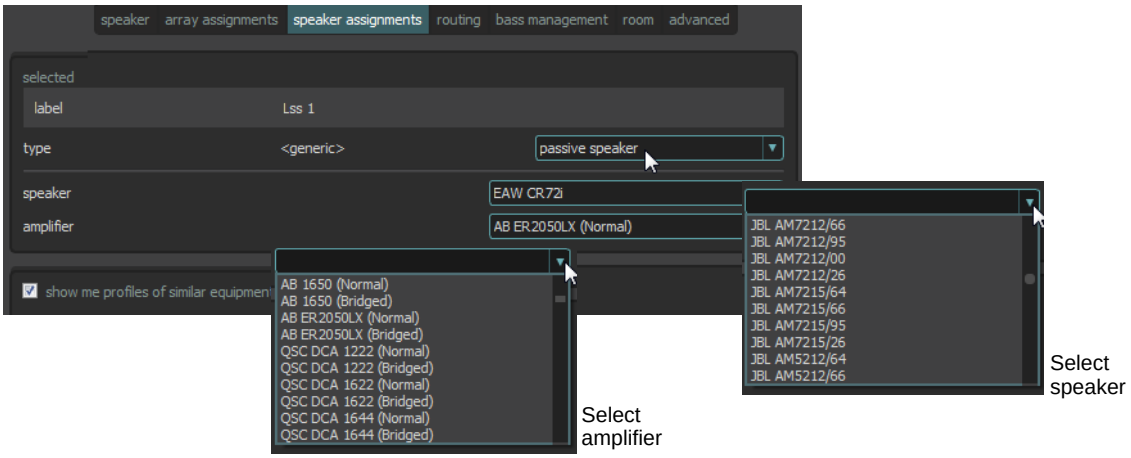


Figure 2-27 Select Passive Speaker (Surround Speaker Example)

6. Click **apply** to confirm your selections and display the manufacturer speaker and amplifier specifications. Repeat this step each time you select and assign a single speaker or a group of speakers.

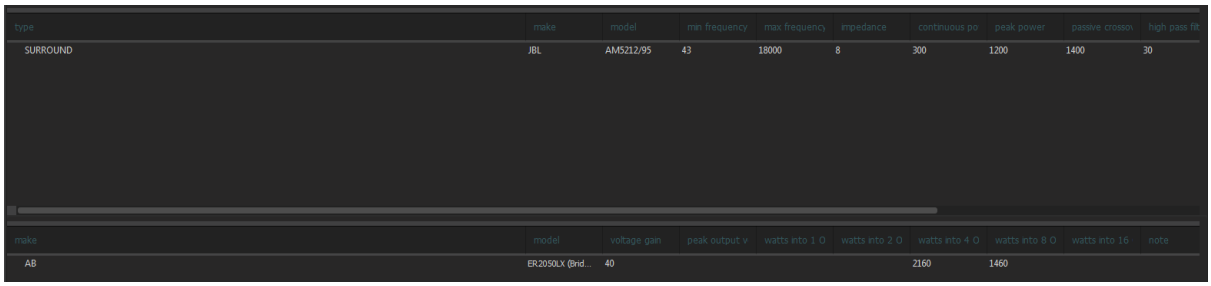


Figure 2-28 Passive Speaker and Amplifier Specifications (Surround Speaker Example)

For screen and Low-Frequency Effects (LFE) channels, an **external processor** (crossover) parameter is provided.

Figure 2-29 Select External Processor (LFE Subwoofer Example)

To assign a crossover profile, click on a speaker that you specified as a crossover in the **populate** screen, then select a crossover profile. You can assign only the crossover type that you specified (2-way, 3-way, or 4-way). The following figure provides an example for a 2-way crossover.

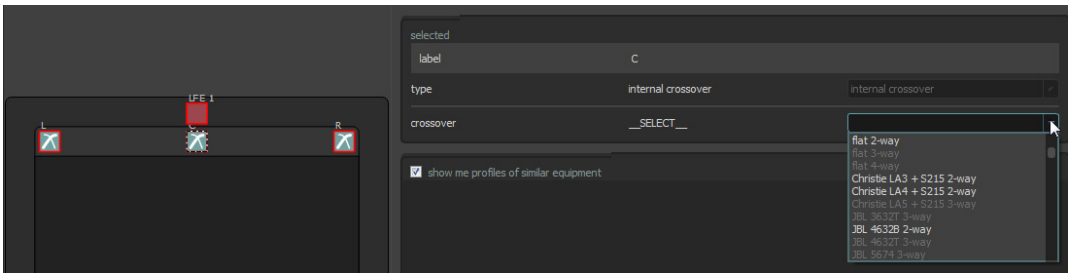


Figure 2-30 Select Crossover

7. Click **apply** to confirm your selections and display the manufacturer processor specifications. Repeat this step each time you select and assign a single subwoofer or a group of speakers.

   In addition, if you check **show me profiles of similar equipment**, this indicates whether a specific .dad profile on the CP850, RMU, or storage device exists in your database. If not, and you need that profile, you can grow your database by pulling the profile and importing it into your database. For information on importing profiles, see Section 2.6.

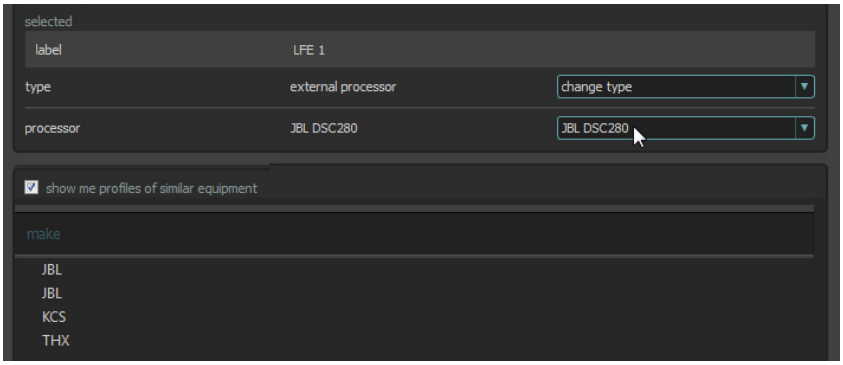


Figure 2-31 External Processor Specifications

2.5.5 Configuring the Routing Parameters

To configure the routing parameters, click the **define** button in the navigation bar at the left side of the screen, then click the define **routing** tab .

The routing parameters appear. In this screen, you can apply Automatic Routing or Manual Routing.

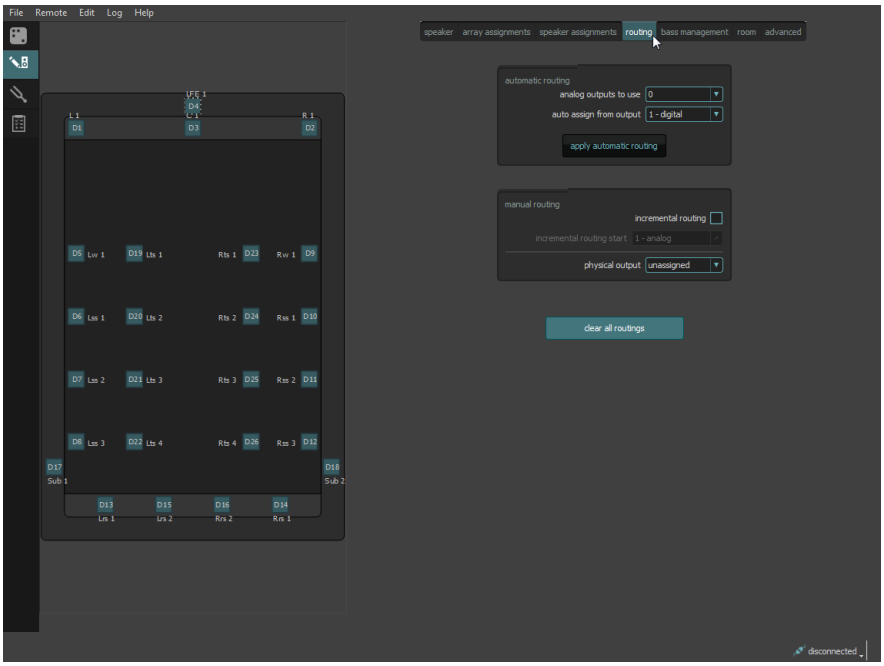


Figure 2-32 Routing Parameters (Three Subwoofers, No Crossovers)

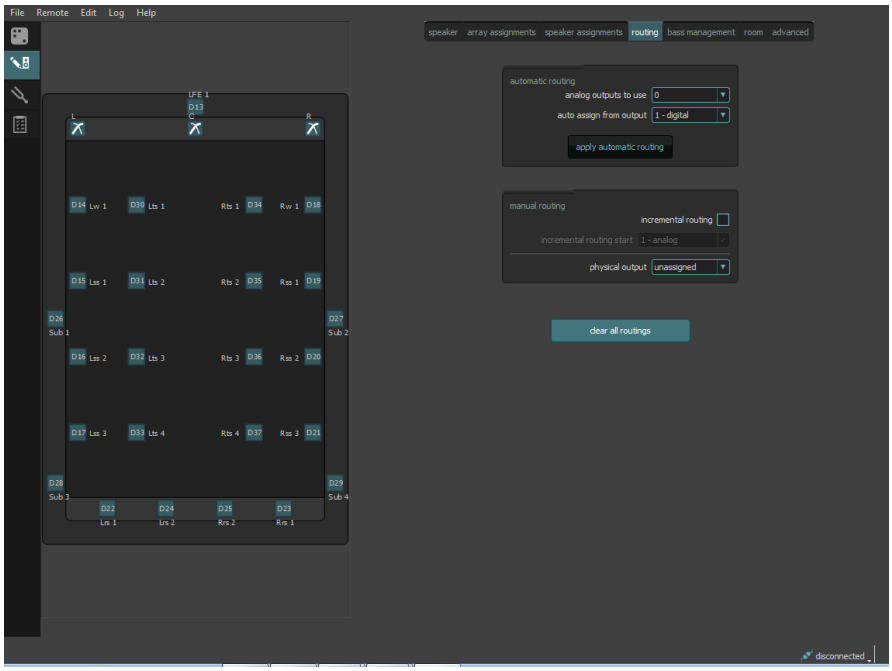


Figure 2-33 Routing Parameters (Five Subwoofers, Three Crossovers)

Automatic Routing

Automatic routing follows these predefined rules:

- The automatic assignment for the screen is Left, Right, Center, and LFE.
- The automatic assignment for the left and right side and ceiling surrounds is screen to booth.
- The automatic assignment for the rear surrounds is left, right, left, right, left, right until the system fully assigns the arrays.

To apply automatic routing:

1. Draw a marquee around a group of speakers (within the gray area) to select them. You can select speakers one at a time by pressing <Ctrl> (or <Command> on a Mac) while you click on each speaker.

   A dashed outline designates each of the selected speakers.

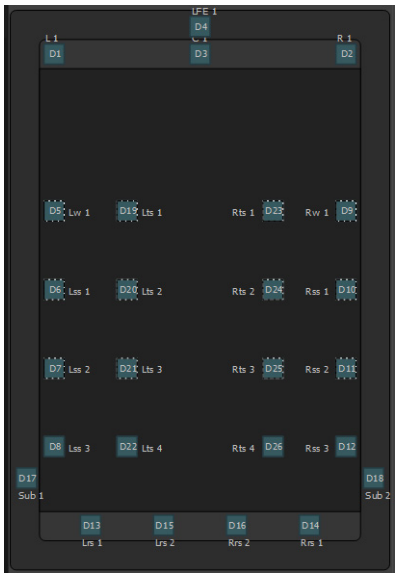


Figure 2-34 Select Group of Speakers for Automatic Routing

2. In the **automatic routing** pane, for a CP850, select the number of analog outputs you are using from the **analog outputs to use** drop-down menu. For an RMU, verify that this parameter is set to 0, as the RMU does not have any analog outputs.

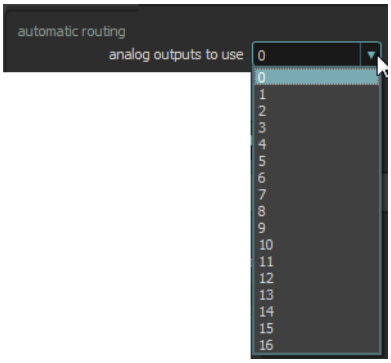


Figure 2-35 Select Analog Output for Automatic Routing

3. Select the output where you want to start the automatic routing operation in the **auto assign from output** drop-down menu.

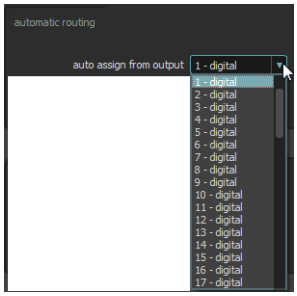
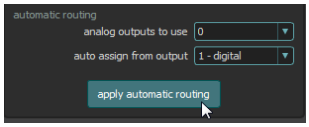


Figure 2-36 Assign First Output for Automatic Routing

4. Click the **apply automatic routing** button. 

   The automatic routing operation begins routing incrementally from the first speaker in the speaker group (according to the previously described automatic routing rules) until the process is completed.

Manual Routing

To apply manual routing:

1. Click on a speaker to outline it
.
2. In the **manual routing** pane, select an output that corresponds to the appropriate routing in the **physical output** drop-down menu. Alternatively, you can type the number of the desired output on your keyboard and press <Enter>.

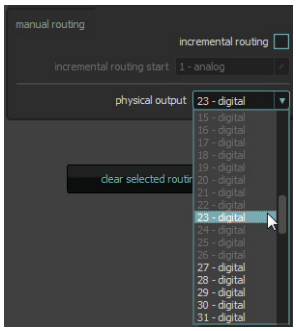


Figure 2-37 Select Output for Manual Routing

3. Repeat steps 1 and 2 for each speaker.
   You can clear all of your selections by clicking the **clear selected routings** button.

Incremental Routing

To enable this feature:

1. Click the **incremental routing** checkbox in the **manual routing** pane.
2. Select the starting output number in the **incremental routing start** drop-down menu.

Note: To enable the incremental routing feature for the RMU, you must select only digital outputs.

3. Click the first speaker in the routing display to assign that output number.
4. Click the next speaker to assign the next output number in order.
5. Continue clicking on speakers to assign additional outputs.
   You can clear all of your selections by clicking the **clear selected routings** button.

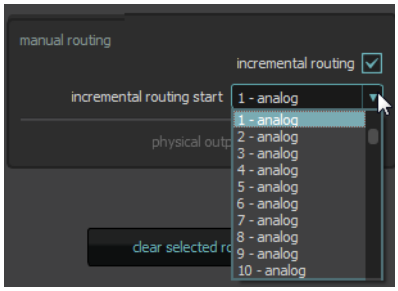


Figure 2-38 Select Starting Output for Incremental Routing

2.5.6 Configuring the Bass Management Parameters

To configure the bass management parameters for subwoofers, click the **define** button in the navigation bar at the left side of the screen, then click the define **bass management** tab bass management .

1. Select speakers one at a time or draw a marquee around a group of speakers.
2. Assign the speakers to the bass management subwoofers.
3. Assign a bass management frequency to the group.
4. Click the **apply** button.

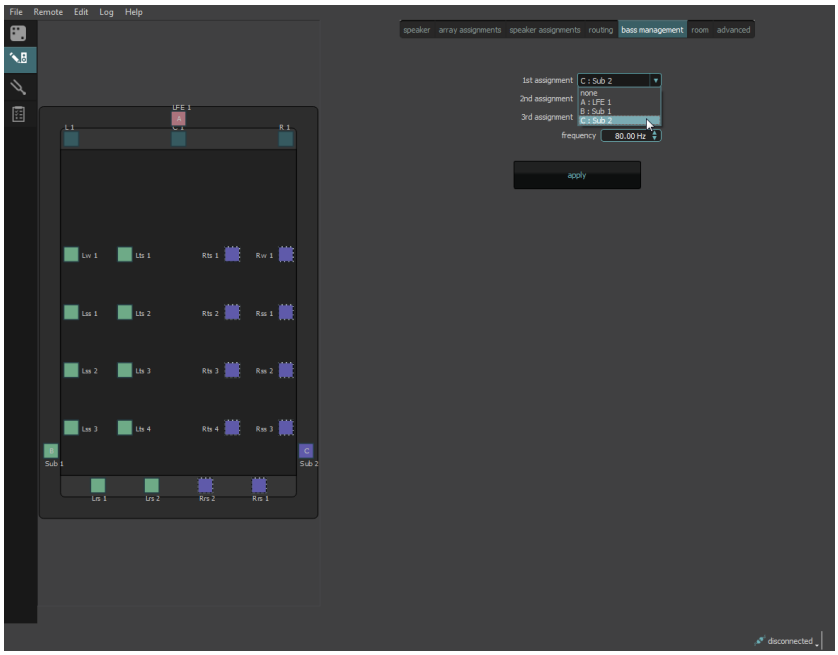


Figure 2-39 Configure Bass Management

2.5.7 Entering the Room Information

To enter this information, click the **define** button in the navigation bar at the left side of the screen, and then click the define **room** tab.

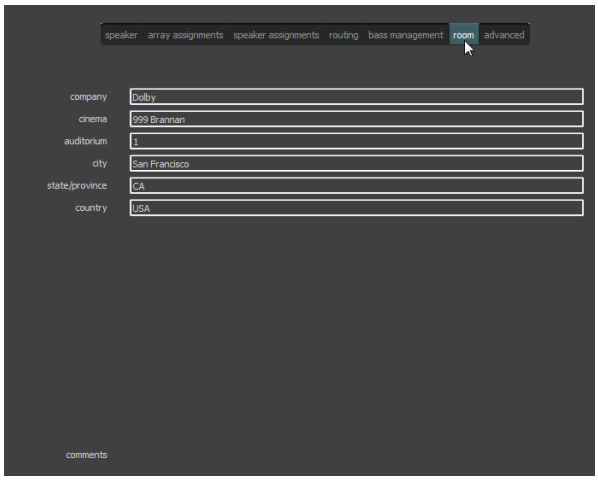


Figure 2-40 Enter Room Information Example

2.5.8 Configuring the Advanced Parameters (CP850 Only)

To configure these parameters, click the **define** button in the navigation bar at the left side of the screen, and then click the define **advanced** tab to verify the speaker limiters setting.

A message indicates that we do not recommend checking the **speaker limiters disabled** box for the CP850, as this disables speaker limiters. In addition, this message explains that if the box is checked, you can uncheck it to reenable speaker limiters. When pushing to the RMU, limiters are automatically disabled whether the checkbox is checked or unchecked.

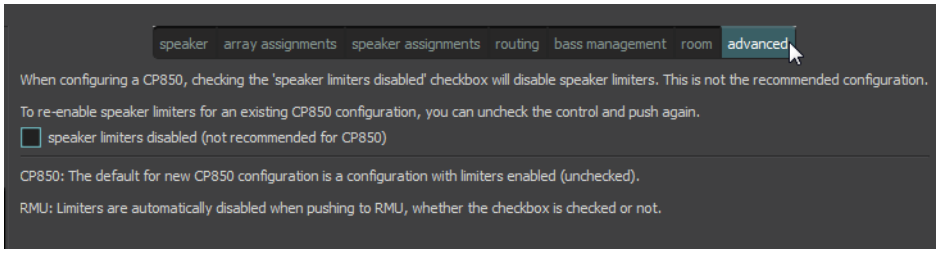


Figure 2-41 Advanced Tab Speaker Limiters Information

2.5.9 Tuning the Room

To tune the room (running AutoEQ):

1. Click the **tune** button in the navigation bar at the left side of the screen to display the tuning screen.

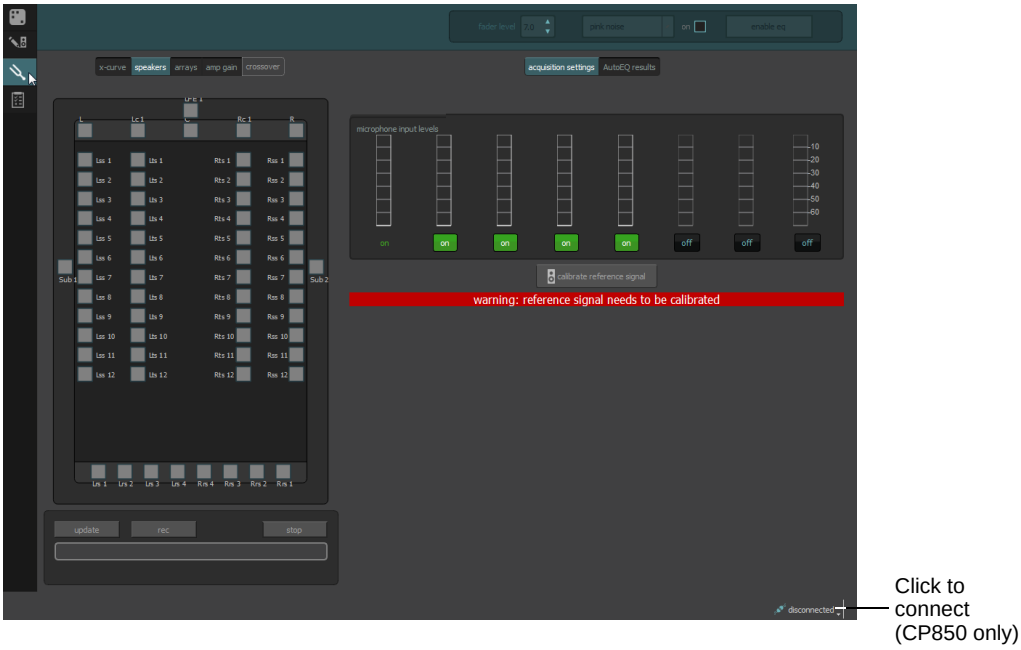


Figure 2-42 Tuning Screen

2. To connect to a CP850, click the **disconnected** button at the lower-right corner of the screen (or in the **Remote** menu), and then click **connect**. For Microsoft Windows, make sure that the Octa-Capture audio buffer size is set to 512 for the driver settings.

   For an RMU, do not click the **disconnect** button. By default, the RMU is connected to Dolby Atmos Designer, because Designer is running on the RMU. Proceed directly to step 5.

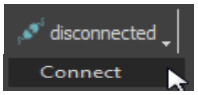


Figure 2-43 Click to Connect to CP850

A warning message indicates that connecting interrupts theatre audio.

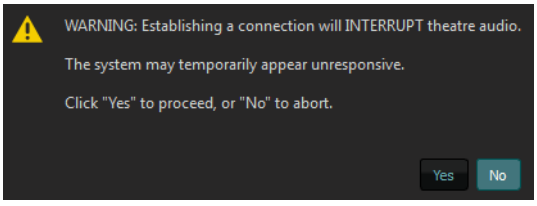


Figure 2-44 Connect Warning

3. Click **Yes** to proceed.
   A dialog box requests an IP address for your CP850.

4. Enter the CP850 IP address, and click **connect** in the dialog box.

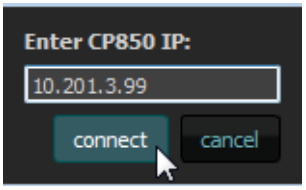


Figure 2-45 Enter CP850 IP Address

Once connected, the **disconnected** button in the tuning screen changes to a **connected** button and you can view the CP850 software version and IP address by clicking on this button. The tuning screen is now activated.

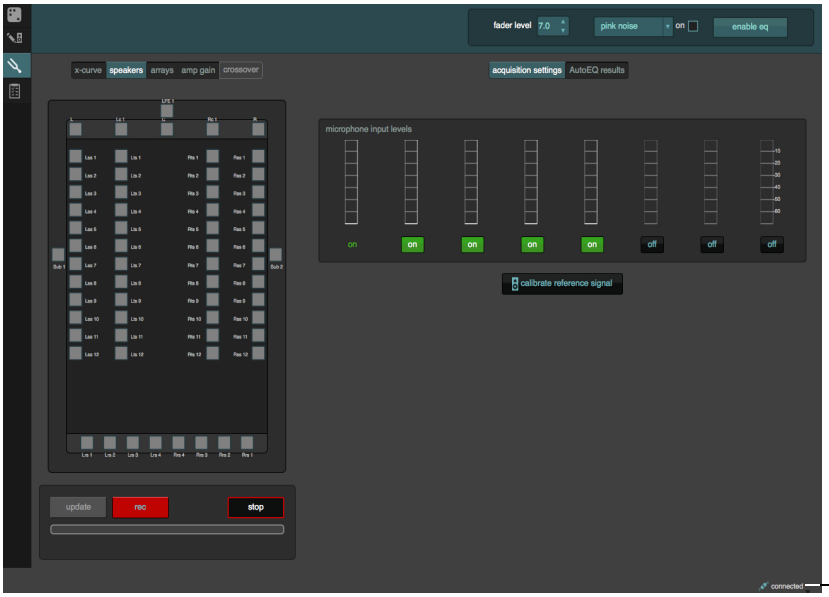
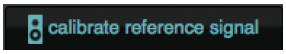


Figure 2-46 Connected to CP850

5. Select the number of microphone inputs you are using for the calibration. An **on/off** button below any meter in the **microphone input levels** section indicates whether the system will use the corresponding microphone input for the acquisition process. You cannot disable microphone 1.

6. Click the **calibrate reference signal** 

button.

The **Reference signal adjustment instructions** appear.

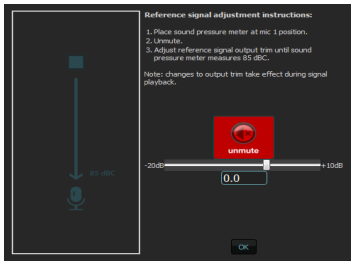


Figure 2-47 Reference Signal Adjustment Instructions

7. Unmute the signal by clicking the **unmute** button.

   The red **unmute** button changes to a gray **mute** button. This generates pink noise from the center speaker. Using an SPL meter, adjust the fader icon until the sound pressure level from the Center channel is 85 dBC.

8. Click **OK**.

   A message prompts you to adjust the amplifier gains. Read the message, then click the **close** button in the dialog box.

9. We recommend that you adjust the output gain of each speaker to optimize the dynamic range of the system:
   a. Turn on noise by clicking the check box at the top of the **AutoEQ** screen.
   b. Select **pink noise** as the test signal.
   c. Select the speaker feed by clicking the desired speaker icon on the left side of screen.
   d. Measure the C-weighted SPL at the reference position in the room.
   e. Adjust the amplifier gain until the speaker output level is 85 dBC.
   f. Note the input gain adjustment.
   g. Repeat the preceding steps for each speaker.
   h. Once the gain adjustments are complete for each speaker, turn off the pink noise.

Note: Set the LFE channel to +10 dB in-band gain (approximately 91 dBC SPL), and set bass management subwoofers to 0 dB in-band gain (approximately 81 dBC SPL).

10. After setting all the speaker feeds to 85 dBC SPL, click the **amp gain** button .
11. Select a speaker feed by clicking a speaker on the left side of the screen. A data entry field appears with up/down arrows.
12. Adjust the amplifier gain using the up/down arrows, based on the input gain adjustment. (See step 9-f.)
13. Repeat the preceding steps for each speaker based on the input gain adjustment. (See step 9-f.)

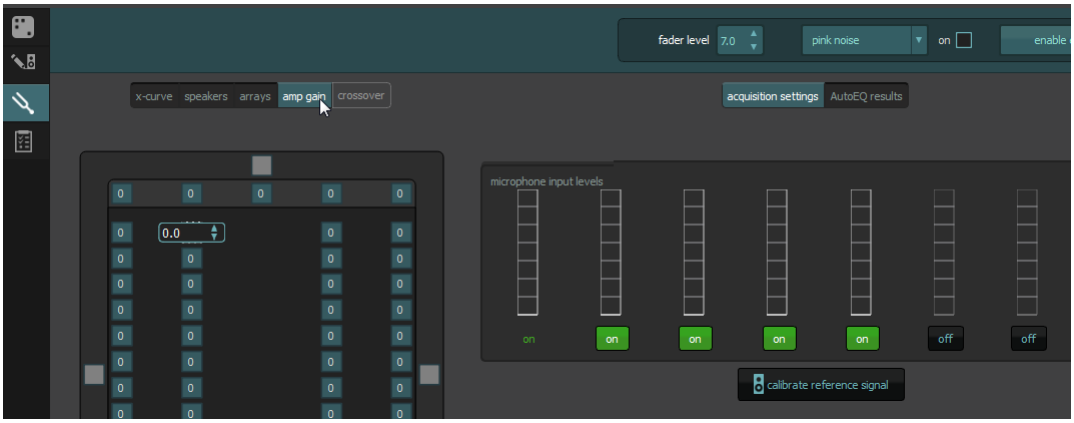


Figure 2-48 Adjusting the Amp Gain

14. Click the **x-curve** tab to display the x-curve parameters and modify, if desired.

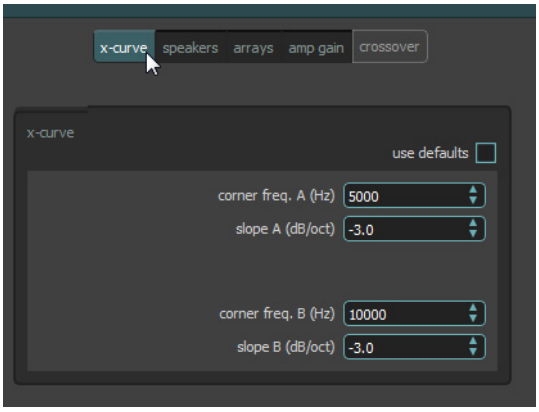


Figure 2-49 X-Curve Parameters

15. Set the boost-level frequencies.

    Boost limits define the point where no boost above 0 dB is applied to frequencies above and below the high and low limits for a speaker or an array feed. The system automatically assigns default boost-limit frequency points to each speaker and array feed. To change the boost-limit frequency:

    a. Select a speaker at the left side of the screen, or draw a marquee around a group of speakers to edit the parameters for that group.
    b. Select the **AutoEQ results** tab.
    c. Edit the boost-limits value by typing in a value or by using the up/down arrows.

Note: Avoid setting boost limits to frequencies above or below the bandwidth limits of the speakers (±3 dB points) to avoid excessive boost where the output of the speaker begins to rapidly decrease.

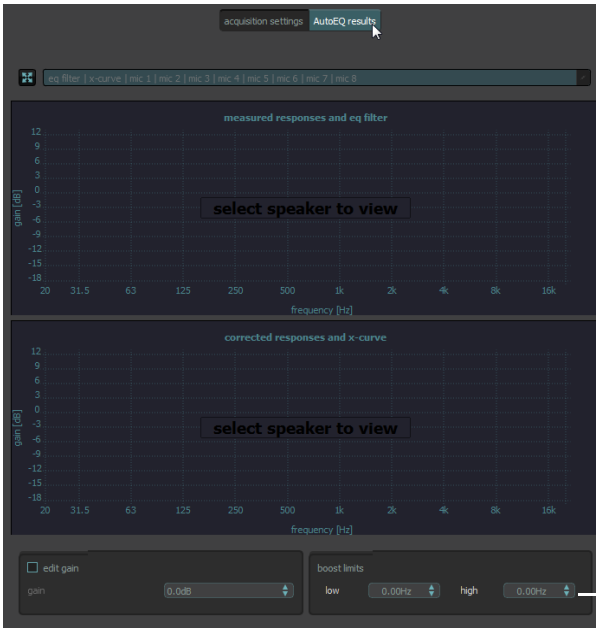


Figure 2-50 Set Boost Level by Clicking the AutoEQ Results Tab

16. Click the record rec button. Be sure you have 4 GB of available storage space on your system, or the recording can freeze during the process.
17. At the prompt, enter a file name and click **save** to save your file if you have not done so already.

    Recording begins immediately. During a measurement, the speaker being measured flashes red and a signal is displayed on the input level meter. In addition, a progress bar appears at the bottom of the screen and the speaker being acquired is displayed below the progress bar.

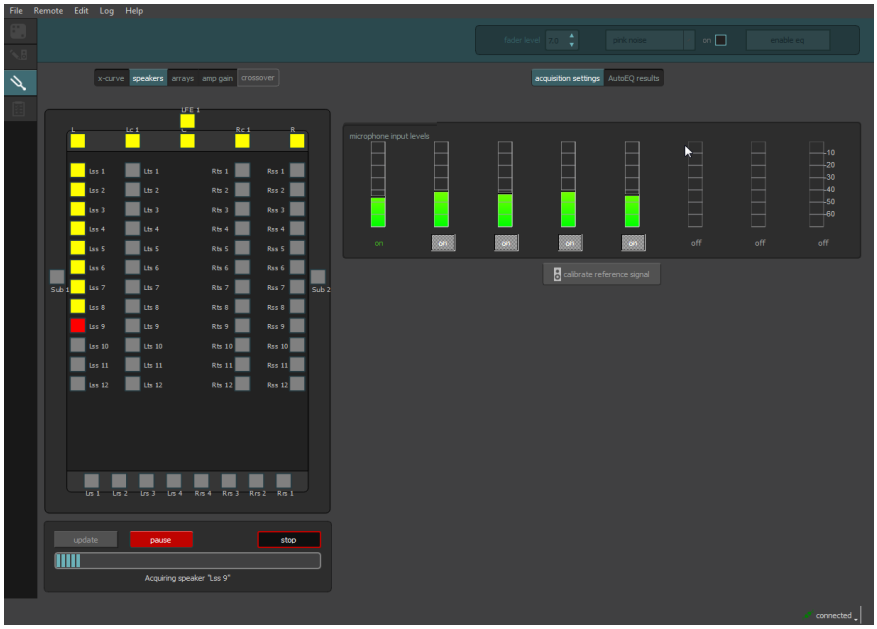


Figure 2-51 Speaker Measurements

When the speaker feed measurement is completed, the system automatically starts processing data. Once processed, a speaker icon turns green, which indicates that the data is in the required range. A red speaker icon indicates a low signal-to-noise ratio, and the data may be invalid. During the EQ process, you can view real-time results by clicking the **AutoEQ results** tab.

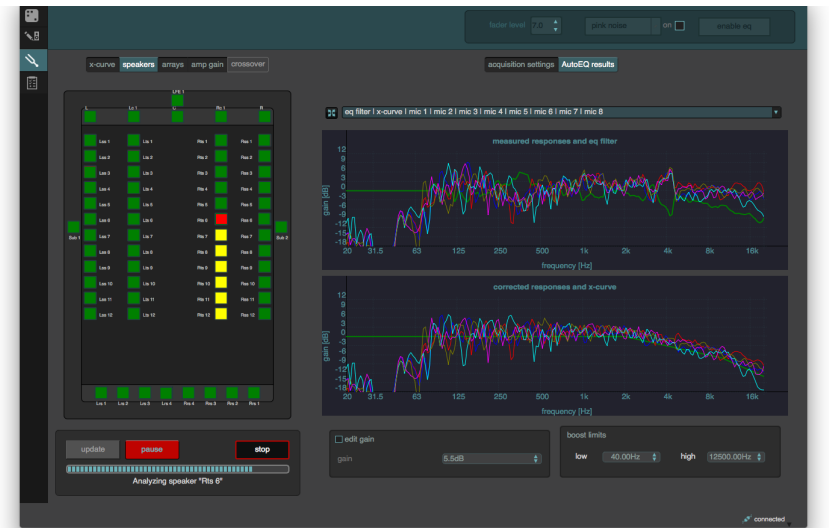


Figure 2-52 Processing Speaker Feed Data (Showing Real-Time AutoEQ Processing)

After speaker feed processing, the system automatically begins array measurements. The arrays being measured flash red, measured arrays appear in yellow, and a signal appears on the input-level meters. Array icons with no color indicate that there is no measurement data present. Some speakers are assigned to multiple arrays. Array icons that are half green and half yellow indicate that one of the arrays is processed and the other is not. Array icons that are half gray and half yellow indicate that one of the arrays contains data, while the other does not. Array icons that are completely green indicate that the array acquisitions were processed.

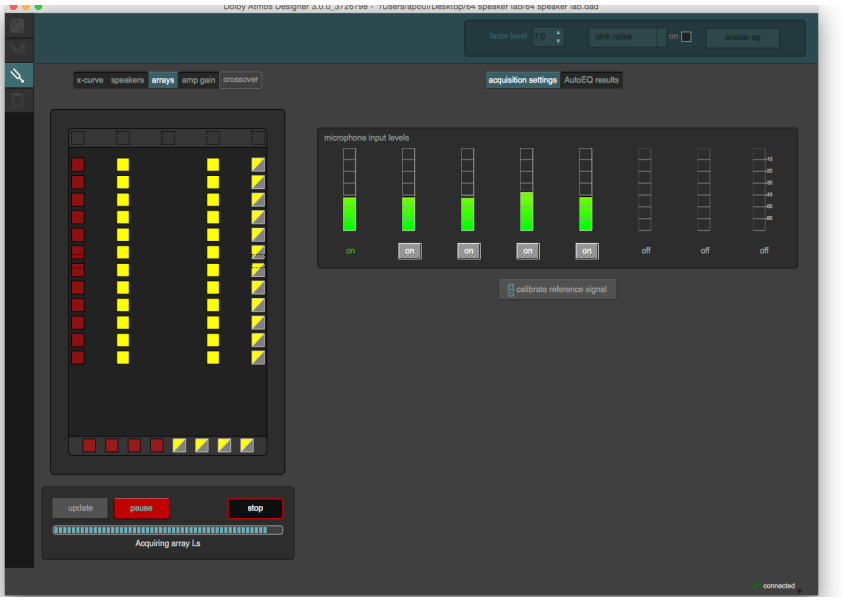


Figure 2-53 Array Measurements

At the end of the entire process, a message indicates that AutoEQ is completed.

Note: If the AutoEQ completed message does not appear, there may be some issues with the acquisition process or other related parameters.

18. Click **OK**.

    Once the equalization process is complete, we recommend that you inspect each speaker feed and array feed to confirm that the equalization and levels are appropriate:

    - Select a speaker feed by clicking a speaker icon on the left side of the screen.
    - Navigate to the **AutoEQ results** tab.
    - Observe the gain value for each speaker feed and equalization curve.
    - If the gain or equalization seems incorrect for a speaker feed, you can:

    a. Remeasure the speaker by clicking on a speaker at the left side of the screen, or select multiple speakers by pressing <Ctrl> and clicking on the desired speakers. You can also draw a marquee around a group of speakers. Remeasure by pressing the **rec** button.

    b. Update the speaker by clicking on a speaker at the left side of the screen, or select multiple speakers by using the methods described in step a. Change a value, such as a boost-limit frequency or x-curve parameter. Select **update** to reprocess the data with the edited value.

Note: If you update a surround speaker, the system remeasures the array to which the speaker feed is assigned.

19. For a CP850, select **Push to CP850** from the **Remote** menu. Proceed to step 20.

    For an RMU, Click **Push to RMU** from the **Remote** menu. When prompted, save the RMU-compatible .dac file to disk. Be sure to give it a different name than the one you specified for step 19. The .dac file is now ready for loading into the RMU for various Dolby Atmos authoring tasks. For information on loading a .dac file into the RMU, see the *Dolby Rendering and Mastering Unit for Cinema User Manual.*

20. Click **Yes** to continue.

    If you are connected to a CP850, the system pushes the Dolby Atmos configuration to your unit. If you are not connected to a CP850, you must enter an IP address at the prompt before the system pushes the configuration to your unit.

    A warning message with a backup prompt appears. You can ignore this warning and click **overwrite**. However, if you need to back up the existing configuration file on the CP850, use the CP850 web client, as described in the settings management section of the *Dolby Atmos Cinema Processor CP850 Manual*.

    When the system writes the Dolby Atmos configuration file to the CP850, a confirmation dialog box appears. Click **OK**.

21. Click **Save As** in the **File** menu to save your .dad file to the desired directory on your PC or Mac as a backup.

Editing Crossovers (CP850 only)

When connected to the CP850, you can edit a crossover profile in real time during the tuning operation:

1. Click the **crossover** tab, click on the desired speaker at the left side of the screen, and then click the **unlock** button

to unlock the crossover profile fields. The unlock button changes to a **lock** button

, which you can click to lock your profile after editing.

Figure 2-54 Unlocking the Crossover Profile

The filters are implemented in real time when pink noise is on.

2. Click the **on** check box to turn on pink noise.

Figure 2-55 Turning On Pink Noise

3. Route pink noise to the speaker by clicking on the speaker at the left side of the screen.
4. Select a way filter to edit by clicking the **low** or **high** tab for a two-way loudspeaker; **low**, **mid**, or **high** for a three-way loudspeaker; and **low**, **low mid**, **high mid**, or **high** for a four-way loudspeaker. The color coding corresponds to the plot in the frequency response graph.

Figure 2-56 Selecting a Crossover Way to Edit

5. Adjust the **gain** and **delay** using the up/down arrows or by editing the text in the respective data entry fields.

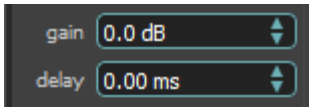
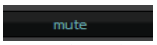


Figure 2-57 Adjusting Crossover Gain and Delay

6. Change the polarity by selecting or from the drop-down selector.
7. To mute a way click the  button. The mute button turns red , and the frequency response plot clears from the graph. To unmute the way, click the **mute** button again.
8. Add a filter by clicking the **high pass** button, **low pass** button, **parametric** button, **high shelf** button, **low shelf** button, or **all pass** button.

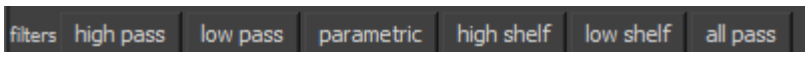


Figure 2-58 Adding a Filter

9. When pink noise is enabled, you can bypass a filter (without deleting it) by clicking the button.

Note: You can use the bypass function only when pink noise is turned on. The bypassed filter is enabled when pink noise is turned off.

10. Adjust a filter frequency, gain, or bandwidth using the up/down arrows or by editing text in the data entry fields for each filter.
11. Adjust the high pass filter or low pass filter type and slope values using the respective drop-down selectors. To change these parameters when pink noise is turned on, you must mute the output.

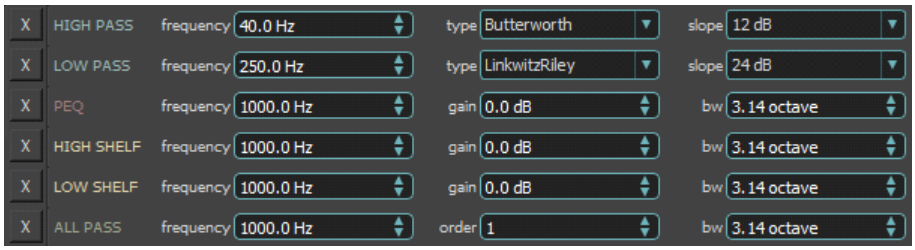


Figure 2-59 Adjusting Filter Frequency, Gain, Bandwidth Filter Type, and Slope

You can remove a filter by clicking the button.

Copying and Pasting Crossover Settings

During the tuning operation (with the crossover profiles unlocked and pink noise turned off), you can copy and paste crossover settings from one speaker to another by right-clicking on the source and destination speaker icons.

Figure 2-60 Copying and Pasting Crossover Settings

2.6 Viewing and Editing the Database

To view and edit the database, click the **manage** button in the navigation bar at the left side of the screen. In this screen, you can view, add, remove, and customize speaker (active and passive), amplifier, external processor, and crossover profiles and view the.dad profiles in your database.

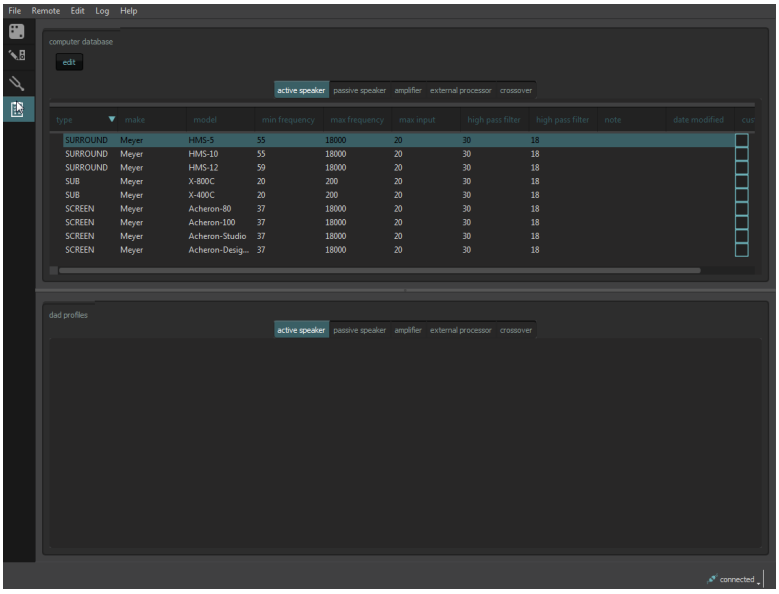


Figure 2-61 Manage Parameters

2.6.1 Adding a New Profile

To add a profile to the database:

1. Click the **edit** edit button at the upper-left section of the screen.

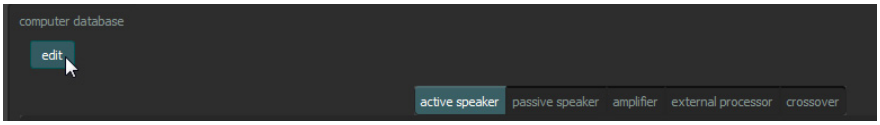


Figure 2-62 Click Edit to Activate Database Modifications

The activated database screen displays add , remove , and duplicate buttons.

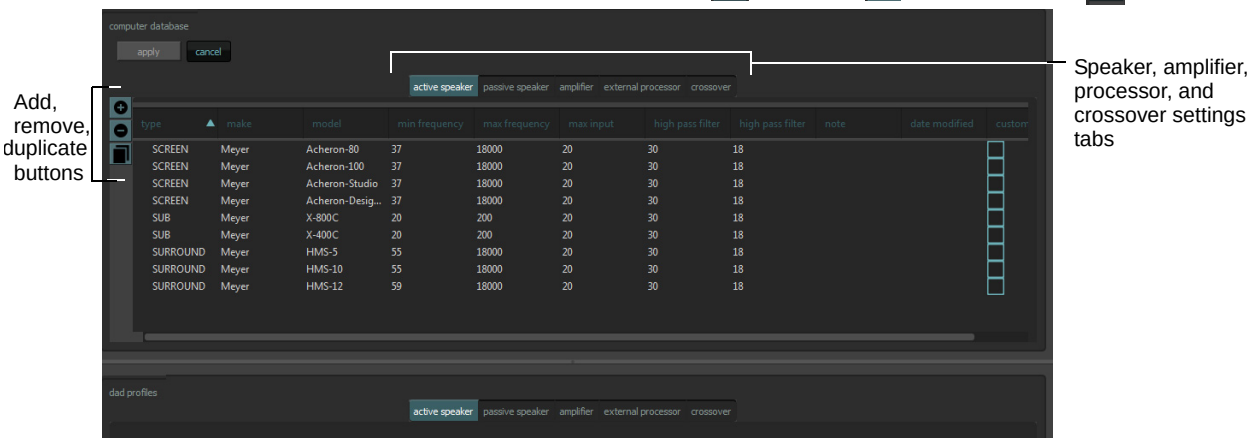


Figure 2-63 Activated Database to Add New Profile

When you click the **active speaker**, **passive speaker**, **amplifier**, **external processor**, or **crossover** tab and then click the add button, you can add a new profile from scratch. If your new profile is similar to an existing profile, you can modify the existing profile. However, if you want to retain the original profile, we recommend duplicating the existing profile and then modifying it, as required (see Modifying a Profile).

To delete a profile, click the remove button.

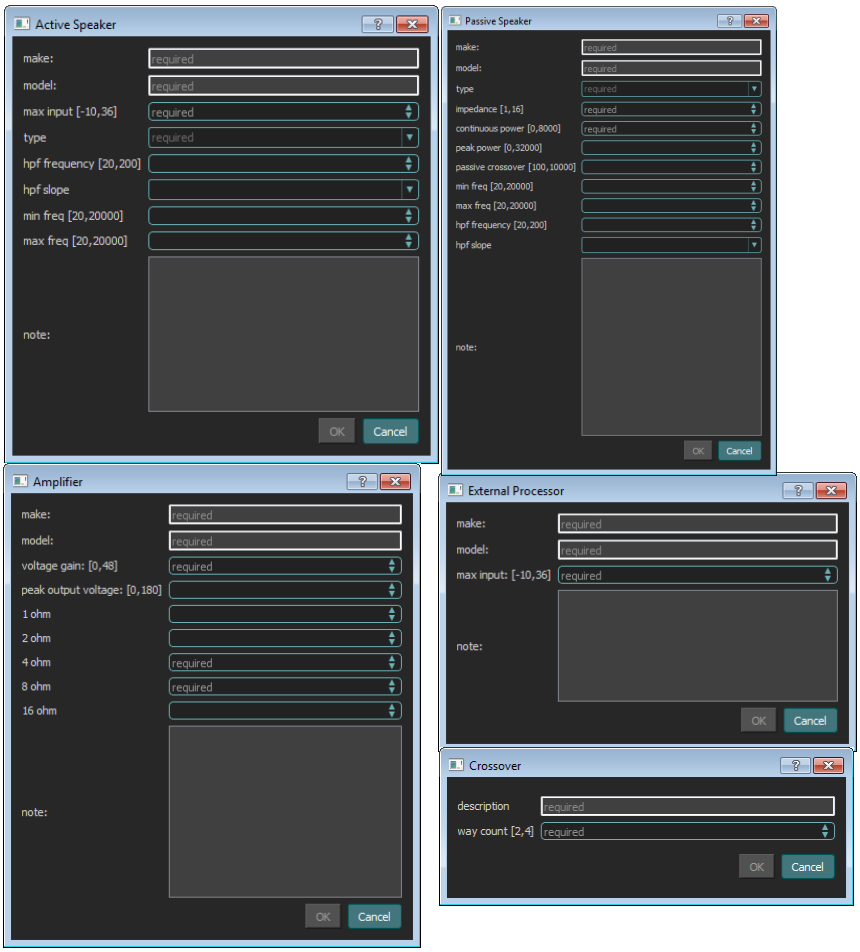
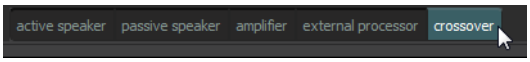


Figure 2-64 Adding New Profiles

Adding a Crossover Profile to the Database (CP850 Only)

To add a new crossover profile to the database:

1. Click the **crossover** tab 

.

2. Click the **edit** button

, then click the add button
, and enter the required information in the **Crossover** dialog box, and click **OK**.

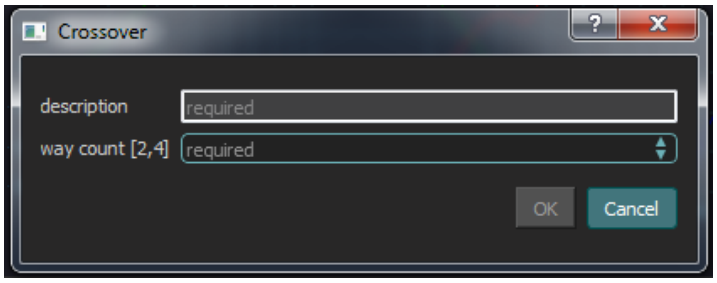


Figure 2-65 Enter Crossover Information

In the **crossover** tab screen, you can view the crossover frequency response and edit any of the current crossover profiles by clicking in the respective fields. You can also delete and duplicate crossover profiles.

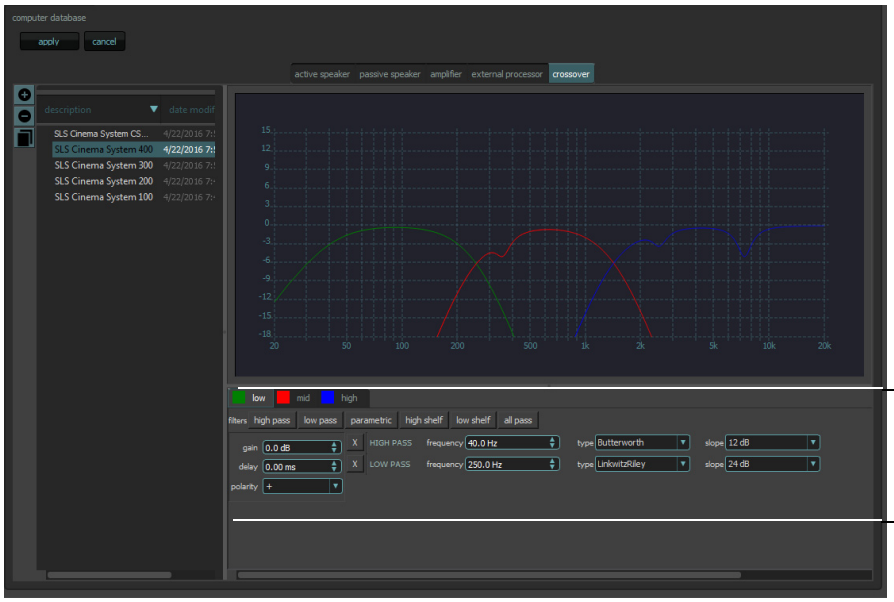


Figure 2-66 Crossover Tab Screen

3. Select a way to edit by clicking the **low** or **high** tab for a two-way loudspeaker; **low**, **mid**, or **high** for a three-way loudspeaker; and **low**, **low mid**, **high mid**, or **high** for a four-way loudspeaker. The color coding corresponds to the plot in the frequency response graph.

Figure 2-67 Selecting a Crossover Way to Edit

4. Adjust the **gain** and **delay** using the up/down arrows or by editing the text in the respective data entry fields.

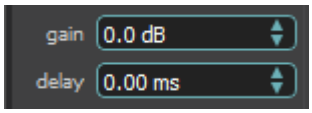


Figure 2-68 Adjusting Crossover Gain and Delay

5. Change the polarity by selecting

or

from the drop-down selector.
6. Add a filter by clicking the **high pass** button, **low pass** button, **parametric** button, **high shelf** button, **low shelf** button, or **all pass** button.

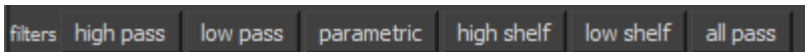


Figure 2-69 Adding a Filter

7. Adjust a filter frequency, gain, or bandwidth using the up/down arrows or by editing text in the data entry fields for each filter.
8. Adjust a high pass filter or low pass filter type and slope from the drop-down selectors.

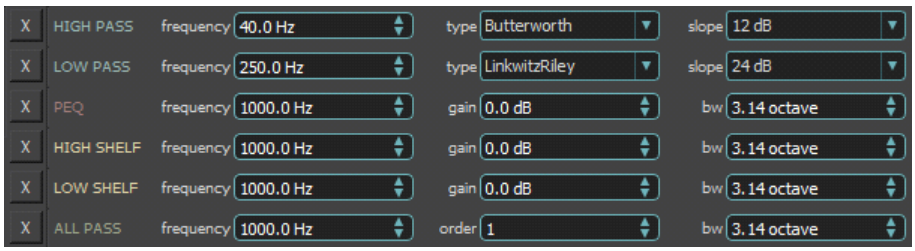


Figure 2-70 Adjusting Filter Frequency, Gain, Bandwidth Filter Type, and Slope

You can remove a filter by clicking the

button.

Modifying a Profile

To modify an existing profile, click the desired profile, then double-click on the parameters you want to change and enter the desired settings. In this case, you do not retain the original profile.

To duplicate and modify an existing profile, click the profile, click the duplicate button and then edit the desired settings. In this case, you retain the original profile.

Boxes with checkmarks next to a profile indicate a **customized** (modified) profile with the **date modified** displayed to the left of the checkbox. This distinguishes a default profile from a user-customized profile.

Values displayed in red indicate that the data is out of range.

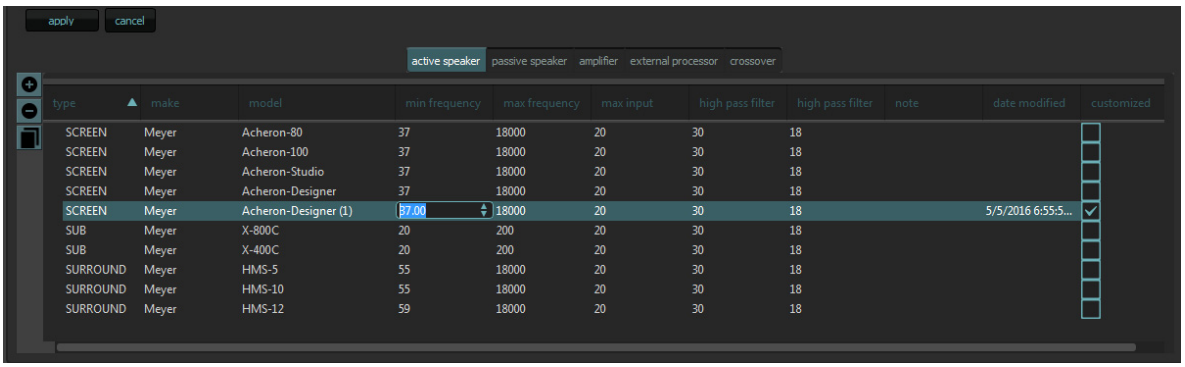


Figure 2-71 Modifying a Profile

To add your new profile to the database, click **apply**, enter the required parameters in the **Update Database** dialog, then click **OK**, and then click **Update**. To undo your settings, click the **cancel** button . This button changes to a **discard** button , and you have an option to apply or discard your settings.

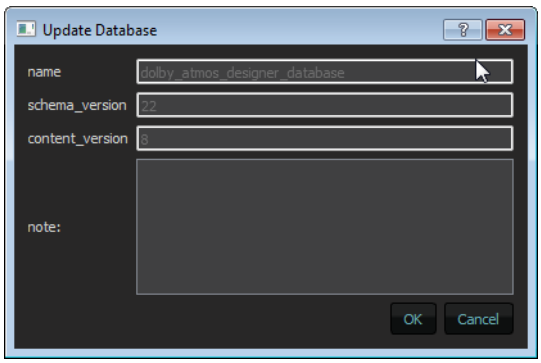


Figure 2-72 Updating the Database with a New Profile

The duplicate **model** name increments by one. In addition, the **content version** in the **Preferences** screen also increments by one.

2.6.2 Viewing and Importing .dad Profiles

If you open a . dac file or .dad file or you pull a configuration from the CP850 or RMU, you can view the profiles assigned to the loudspeakers by that configuration. You can filter by type by clicking the respective tab in the **dad profiles** section of the **manage** database screen, as shown in the following figure for a flat 4-way crossover profile. If the currently loaded profile does not exist in your database, you can import that profile by selecting **Import dad profiles** in the **File** menu.

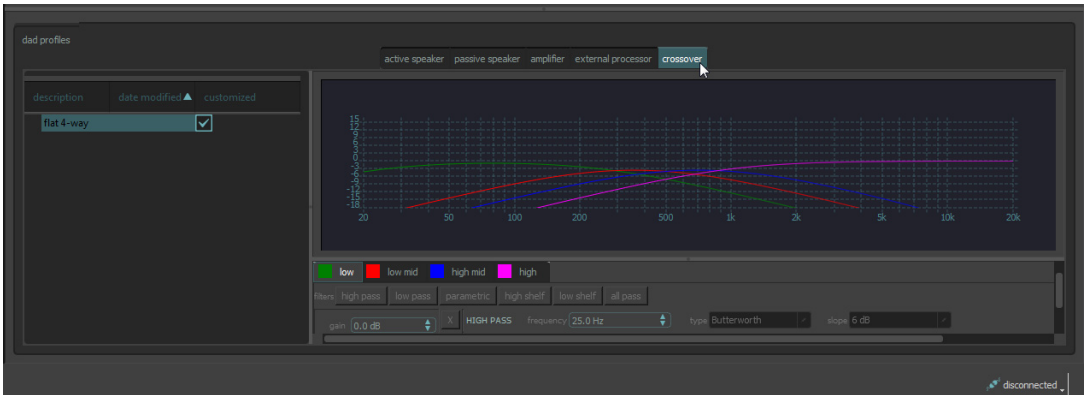


Figure 2-73 Viewing a .dad Profile

2.6.3 Additional Database Functions

The **File** menu and the **Preferences** screen provide additional database functions.

File Menu

You can use the **File** menu to perform additional database functions, as shown in the following figure.

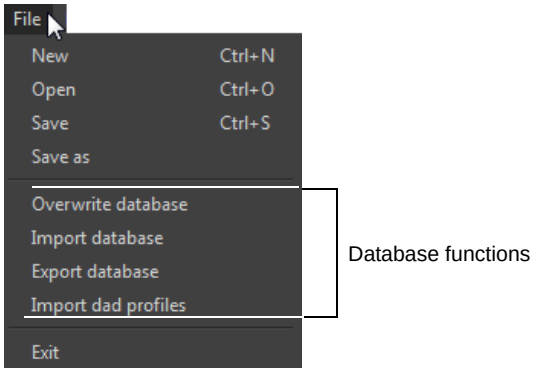


Figure 2-74 File Menu Database functions

- **Overwrite database**: Opens a database (.db) file, and uses it to replace your current database.
- **Import database:** Imports a .db file, but replaces only those records that do not currently exist in your local database.
- **Export database**: Copies your entire local database to an external disk.
- **Import dad profiles**: Copies the currently loaded configuration, and merges it with your existing database. This function copies only those files that do not currently exist in your database.

Preferences Screen

You can also perform the previous **File** menu database functions (except for **Overwrite database** and **Import dad profiles**) and display additional database information by selecting **Preferences** in the **Edit** menu (or in the **Dolby Atmos Designer** menu on a Mac).

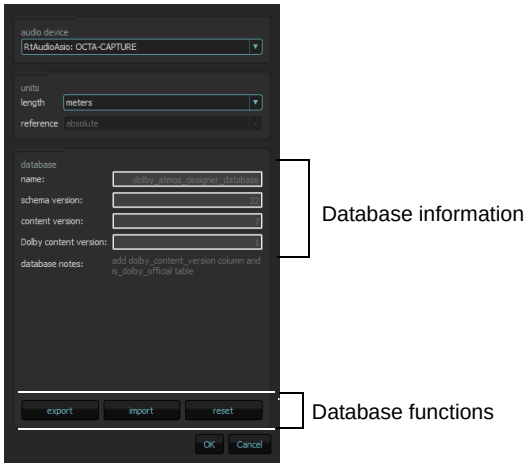


Figure 2-75 Preferences Screen Database Functions

In addition, you can reset your database to the factory defaults in the **Preferences** screen. When you select the **reset** button reset in this screen, the system displays a caution message dialog box that reminds you to export your database to retain your custom profiles before resetting to factory defaults. When you click the **Reset** button Reset in the dialog box, your database returns to the factory defaults.

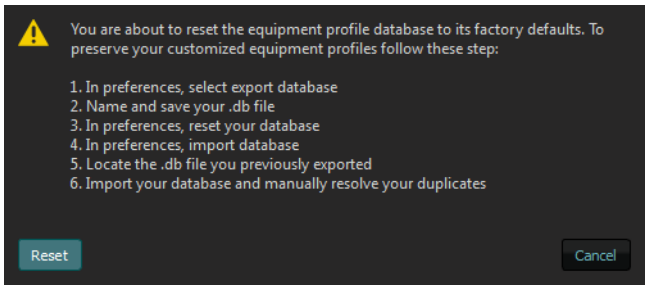


Figure 2-76 Reset Database