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Introduction

Dolby® Atmos is available as a factory installed upgrade to the LS10 with the addition of the Datasat H717 decoder card. Please contact your Dealer for more information on pricing and how to arrange for the upgrade.

To check if your LS10 already has Atmos installed, check the **Setup** screen on the LS10 front panel touch screen. This can be accessed by touching the **Gear** icon from the Home screen. Atmos will appear in the options list, if it is installed.

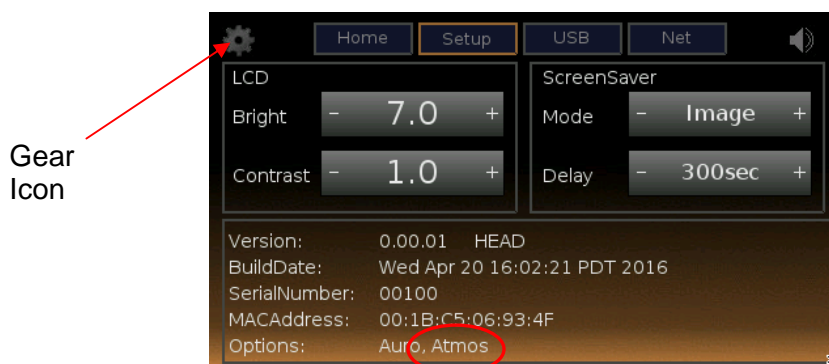


Figure 1 Setup Screen

The LS10 with the H717 card installed and software update V1.01.00 or above is capable of the following Dolby and DTS decoder and post processing technologies:

- Dolby® Atmos
- Dolby® Digital
- Dolby® TrueHD Decoder
- Dolby® Digital Plus Decoder
- DTS-HD Master Audio™ and DTS-HD High Resolution
- DTS Neo:X / 11.1™


The LS10 software includes new speaker configurations for Dolby® Atmos up to 9.1.2, 7.1.4 or 5.1.6 channels (with up to 2 sub woofers).

This document focuses on the operational and configuration changes related to Dolby® Atmos.

- ☒ Please also refer to the LS10 Installation and Operating Guide (*TM-H663 1.01* and above) for more information on the LS10.
- ☒ For more detailed information on speaker placement and layout please see the Dolby Atmos Home Theater Installation Guide, available on the Dolby website.

Dolby Atmos is an immersive sound technology that is based on the use of sound objects. The Atmos decoder uses location metadata to interpret where to place sound objects in the correct location for the selected speaker configuration. In addition to the traditional 5.1 or 7.1 speakers, Atmos mixes incorporate objects which will be rendered to “height” speaker pairs (2, 4 or 6) either mounted on the ceiling, or by use of special up-firing speakers, and to the lower speakers. The special up-firing speakers are known as Dolby Enabled Speakers or DES. Dolby Surround also includes an Upmixer to expand the audio of legacy channel based stereo, 5.1 or 7.1 content.

- ☒ Legacy Dolby PLII, PLIIx and PLIIz upmixing is replaced by the Dolby Surround upmixer.

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- ☒ Auro 3D is a different immersive sound system, created by Auro Technologies, which is an option on the LS10. Dolby Atmos and Auro 3D use different speaker placements for the extra channels (above 5.1 or 7.1 traditional surround speaker placements) and therefore are normally not both used for the same LS10 installation. For detailed information about Auro 3D along with setup information, see the LS10 User Guide TM-H663.

The Atmos speaker configuration is described using three sets of numbers separated by decimal points, example: 7.1.4.

- The first number refers to the number of traditional surround speakers (7 in the above example)
- The second number refers to the number of sub woofers (1 in the example)
- The third number refers to the number of ceiling or up firing DES speakers (4 in the example).

DOLBY ATMOS REFERENCES:

Follow these links to the Dolby website for more information about Dolby Atmos

Dolby Atmos for the Home

<http://www.dolby.com/us/en/technologies/dolby-atmos/dolby-atmos-for-the-home-theater.pdf>

Dolby Atmos installation guide

<http://www.dolby.com/us/en/technologies/dolby-atmos/dolby-atmos-home-theater-installation-guidelines.pdf>

1. LS10 Output Connections

The LS10 XLR Speaker outputs are fixed and defined for Left, Right, Center, Left Surround, Right Surround, and Subwoofers (2), these outputs never change. The remaining outputs are assignable depending on the setup configuration. Although some LS10's may have numbered or labeled outputs, it's very important to follow the menu display after configuration for correct channel output connections.

For this reason you must first complete the speaker configuration in the setup menu. After this has been completed all XLR channel output assignments will be displayed in the setup menu (Output Channel assignments screen). This will show the configured channel output assignments for channels 1 – 15 and will enable the proper output connection to the correct channels. Prior to connecting output channels you must first define them in the Technicians Setup Menus.

2. Using a VNC Program to Access the LS10 Technicians Setup Menus

Setup and calibration of the LS10 cannot be performed using the front panel user touch screen. To access the Technicians setup menus, use of a VNC (Virtual Network Computing) program is necessary. A VNC program allows a computer to control the LS10. Any wireless device, computer, ipad, smart phone, etc. can have a VNC program installed to control the LS10 and access the Technicians menus.

Many VNC programs can be downloaded free from the internet. Download the correct VNC for your operating system. Some suggested VNC programs are: VNC remote, VNC Mocha, Real VNC and Tight VNC. Only download a VNC viewer program. VNC programs can be used both for wireless and network applications, the following only addresses basic wireless operation.

Steps:

1. Load a VNC viewer program onto the device you wish to use to setup the LS10.
2. On the LS10 touch screen, select the **Gear** icon (see Figure 2)


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Figure 2 Gear Icon

- The **Setup** screen will appear. Select the **Net** button (see Figure 3).



Figure 3 Net Button

- The **Network** screen will appear (see Figure 4).

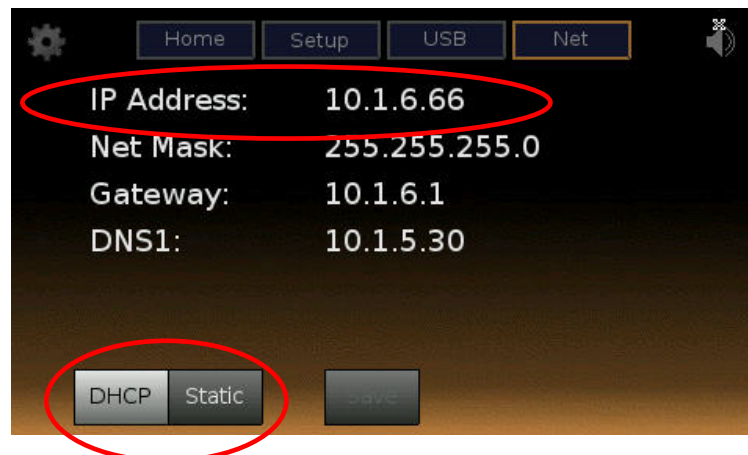



Figure 4 Network Screen

Check to see if your LS10 already has an IP Address assigned. If so, note it and proceed to step 5. If no IP Address is assigned, choose the DHCP button, wait for 30 seconds then power cycle the LS10 from the rear power switch. When the LS10 powers back on return to this screen and note the IP Address.

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5. Verify that the computer or other device being used for LS10 setup is connected to the network or wireless router. The LS10 and the computer must be connected to the same network. The connection from the computer to the router may be wired or wireless, but the connection from the router to the LS10 must be wired.
6. Open your VNC program. The example used is Tight VNC, but all programs should be similar. The first screen will ask for the LS10 IP address. Enter the address and select **Connect**.



Figure 5

7. Enter the Password (no user name is required). The default Password is the minus (-) symbol. Select **OK**.




Figure 6

The Home Setup screen will appear.



Figure 7 Home Setup Screen

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Note: If desired you can also view the front touch screen thru the VNC program. Both screens can be active at the same time. Open the VNC viewer and enter the LS10 IP address adding “:1” to the end of the address. The LS10 Touch Screen image will appear.



Figure 8 LS10 Touch Screen

3. Configuring Dolby Atmos Speakers

Connect to the LS10 using a VNC viewer. The Home Setup screen will appear. Select the **Bass Management** button.

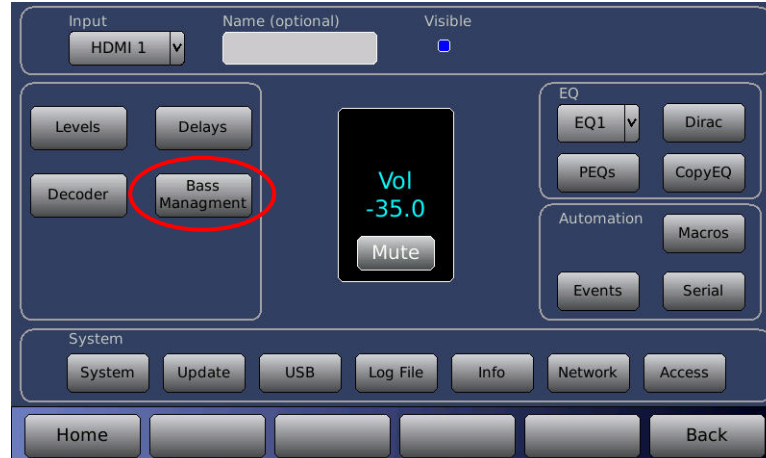



Figure 9 Bass Management Button

The Bass Management Setup screen will appear (see Figure 10 below). This screen will allow you to complete Speaker Configuration of the room including any Bass Management you wish to use. Bass Management configuration is not covered in this document. Please refer to the LS10 User Guide, TM-H633 for more information.

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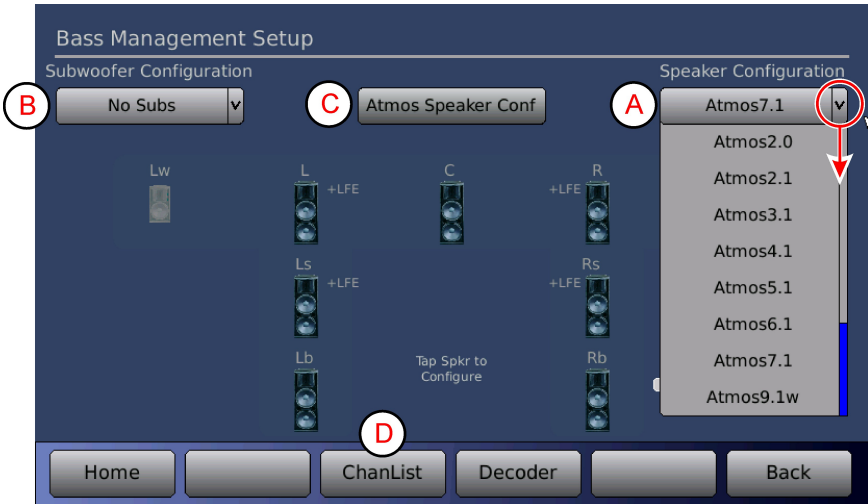


Figure 10 Bass Management Setup Screen

- A. Speaker Configuration.** Using the pull-down menu, choose the configuration that matches the maximum number of standard surround speakers that are installed in the room. Make sure that you choose an Atmos configuration. For example, choose Atmos7.1 not 7.1 from the pull-down menu.
- B. Subwoofer Configuration.** Select the sub-woofer configuration from the pull-down menu.
- C. Atmos Speaker Configuration.** After setting the basic Atmos speaker configuration in steps A and B, the Dolby Atmos ceiling speakers can be configured. Select the **Atmos Speaker Conf** button. The screen in Figure 11 below will appear.

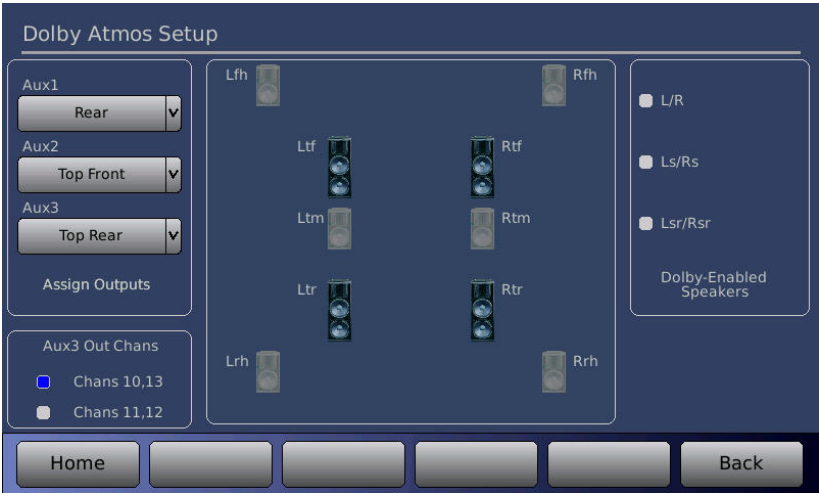



Figure 11 Dolby Atmos Setup Screen

- Assign Outputs.** Three Aux channel pairs are available for assignment. Use the pull-down menus to assign channel outputs to speaker locations.
- The availability of Aux output assignments will change depending on the number of basic speakers in the configuration selected in step A. Some Aux channels will already be assigned to basic speaker locations in the higher speaker count configurations (6.1 and above).

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Aux 1

Off
Top Front
Top Middle
Top Rear

Aux 2

Off
Front Height
Top Front
Top Middle
Top Rear

Aux 3

Off
Rear Height
Top Front
Top Middle
Top Rear

- ☒ Aux 1 assignment choices are not available when 6.1 or 7.1 Atmos is selected. The default "Rear" will appear which provides audio to the rear surround channels Lsr and Rsr.
- ☒ Aux 1 and Aux 3 assignment choices are not available when 9.1W Atmos is selected, the default "Rear" will appear in Aux 1, and "Front Wide" will appear in Aux 3.
- ☒ If Aux channel locations have already been assigned to another Aux channel the choice will be grayed out and cannot be selected.

Aux 3 Out Chans. This selection allows you to choose to place the Aux 3 channels on either channels 10 and 13, or channels 11 and 12. The selection will appear on the Output Channel Assignments screen (see Figure 12 below).

Dolby-Enabled Speakers. See section 5 below. This selection is not used with ceiling mounted speakers.

4. Confirming XLR Channel Outputs


Return to the Bass Management screen and select the **ChanList** button (see Figure 10 D). The **Output Channel Assignments** screen will appear.

Output Channel Assignments	
Output	Channel
1	L
2	R
3	C
4	Ls
5	Rs
6	Lsr
7	Rsr
8	Ltf
9	Rtf
10	Ltr
11	
12	
13	Rtr
14	Sub1
15	Sub2

Figure 12 Output Channel Assignments Screen

This screen lists all the fixed output channel assignments by number and channel IDs, along with the configured Atmos channels that were setup in the previous step above. With this information you are able to correctly connect the output channels from the LS10.

The rear panel labeling on your LS10 will be one of the two examples shown below in Figure 13. The XLR channel outputs 1 – 5 & 14 - 15 are fixed for channels L, R, C, Ls, Rs, Sub 1 and Sub 2. Channels 6 – 13 outputs (noted by the dashed lines) will depend on the speaker configuration setup. Once the speaker configuration has been completed, the **Output Channel Assignments** screen (Figure 12) will display the correct channel outputs using channel numbers and names.

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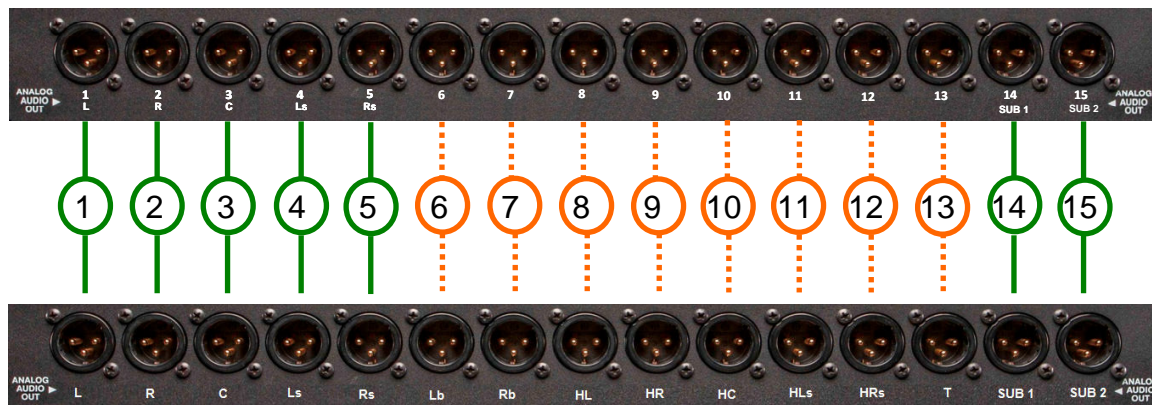


Figure 13 LS10 Rear Panel XLR Output Connectors

The above example of LS10 XLR outputs (Figure 13) show the rear panel versions that may have numbered labels or may have channel ID's. It's very important to understand that channel ID's (noted by the dashed lines) may not be the correct channel output and you must refer to the final setup and channel assignment (Figure 12) "Output Channel Assignments" page for correct output channel connections.

5. Dolby Enabled Speakers

On the right side of the Dolby Atmos Setup Screen are selections for Dolby-Enabled Speakers (see Figure 11). Do not choose any of these when using ceiling mounted speakers.

Dolby-Enabled Speakers (DES), are now available from many speaker manufacturers. This type of speaker incorporates an additional speaker pointed upwards, designed to be part of, or fit on top of, existing floor speakers. See the generic example in Figure 14. The up-firing speakers are designed to reflect audio off the ceiling to simulate ceiling installed speakers. Although ceiling speakers are preferred it may not always be possible or desirable to install ceiling speakers. For example general installation cost of ceiling speakers, restrictions of being in a rental home, or the ceiling construction itself, could make Dolby-Enabled Speakers the alternative over installing ceiling speakers.

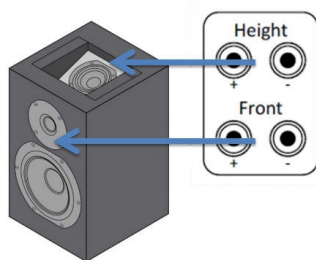



Figure 14 Dolby Enabled Speaker (DES)

Refer to the Dolby Home Installation Guide for the proper placement of these speakers to best fit your room environment. Depending on the basic speaker configuration either one or two pairs of DES speakers will be chosen and assigned.

The selections for Dolby Enabled Speakers are:

- (L/R) Left and Right Front
- (Ls/Rs) Left Surround and Right Surround
- (Lsr/Rsr) Left surround rear and Right surround rear

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When Dolby Enabled Speakers are selected, these selections will become available for Aux output assignment in the pull-down menus.

Example:

The Atmos speaker configuration of the room will be 7.1.4 using DES speakers. The Front Left and Right speakers are DES and the Left and Right Surround rear speakers are also DES.

Begin by selecting the basic **Speaker Configuration** of **Atmos7.1**. This is done by using the pull-down menu selection as shown in Figure 10 A.

Next select **Atmos Speaker Conf** (Figure 10 C), the menu screen in Figure 15 below should now appear.

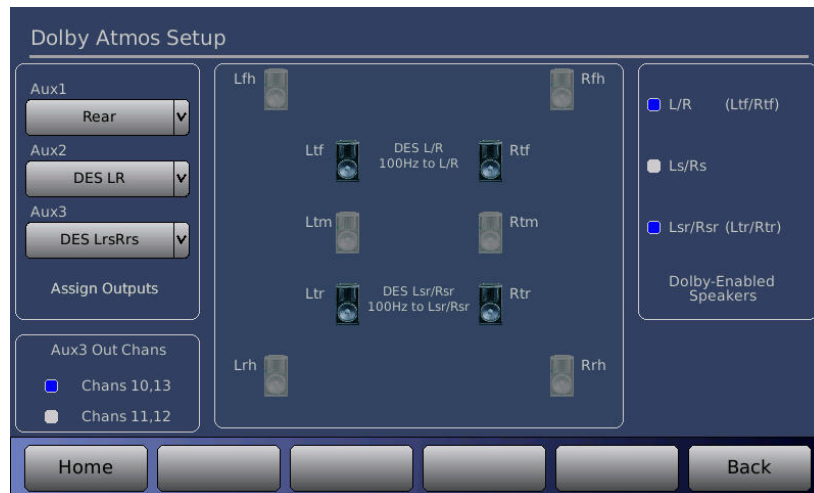


Figure 15 Example Atmos Speaker Conf Menu

Select **L/R** and **Lsr/Rsr** from **Dolby Enabled Speakers**. An error message will appear until these selections are assigned to an output.

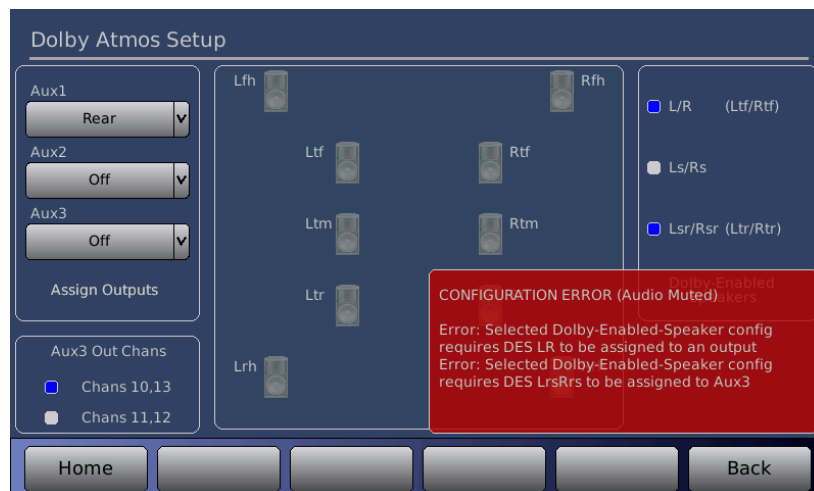



Figure 16 Output Error Message

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In the pull-down menu for **Aux 2** select **DES LR**. In the pull-down menu for **Aux 3** select **DES LrsRrs**. Note: **Aux 1** is not selectable with the Atmos7.1 format since the rear surrounds are already assigned to channels 7 & 8.

Although the screen shows speakers remember that this is only a virtual location of the reflected audio from the Dolby Enabled Speakers.

When using DES, the speakers will also need to be set to **Small**. An error message will appear until this is done. To change from Large to Small simply click on the speaker to open up the configuration menu.

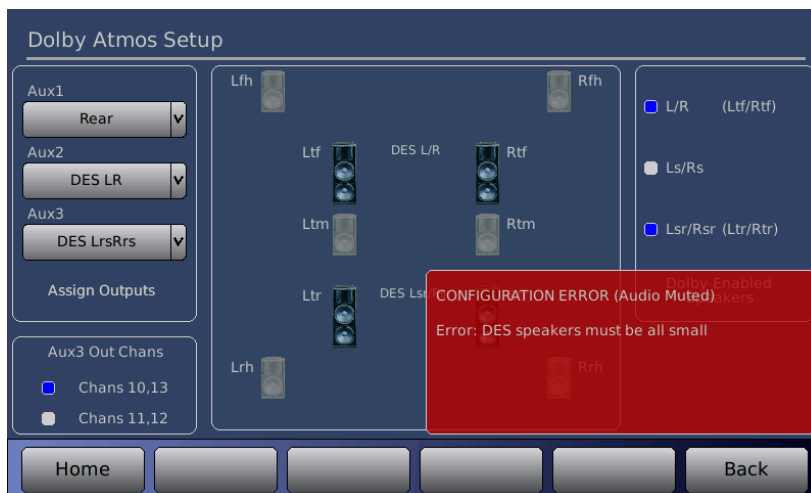


Figure 17 Error Message – DES speakers must be small

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