Introduction

The RS20i with the H693 card installed and software update V1.05.00 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:X™
- DTS-HD Master Audio™ and DTS-HD High Resolution

The RS20i software supports speaker configurations for Dolby® Atmos up to 9.1.2, 7.1.4 or 5.1.6 channels (with up to 4 sub woofers). The H693 card also offers:

- Four 12V trigger out connections that may be used for automation functions such as powering on the amplifiers.
- A USB Audio connection.

This document focuses on the operational and configuration changes related to Dolby® Atmos. There is also information on using the 12V trigger out connections and USB Audio interface setup.

⚠ Software must be updated, before using the H693 card. The H693 card will only function with RS20i system software V1.04.00 and above. The most current software is provided with the H736 upgrade kit.

☑ Please refer to the RS20i Atmos Decoder card installation document (*TN-H747*) for information on installing the H693 card. The H693 card replaces the existing H555 Decoder card. The RS20i will not function with both cards installed.

☑ Please also refer to the RS20i Installation and Operating Guide (*TM-H529 1.02* and above) for more information on the RS20i.

☑ For more detailed information on speaker placement and layout please see Dolby Atmos Home Theater Installation Guide, available on the Dolby website.

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. Atmos 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 Atmos upmixer.

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).

1. Configuring the RS20i Dolby Atmos Menus

To configure Atmos speakers, select **Setup** > **BassMan**. The screen in Figure 1 below will appear.

Figure 1 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.

B. Subwoofer Configuration. Select the sub-woofer configuration from the pull-down menu.

C. Height Speaker Configuration. After setting the basic speaker configuration in steps A and B, the Height ceiling speakers can be configured. Select the **Height Speaker Conf** button. The screen in Figure 2 below will appear.
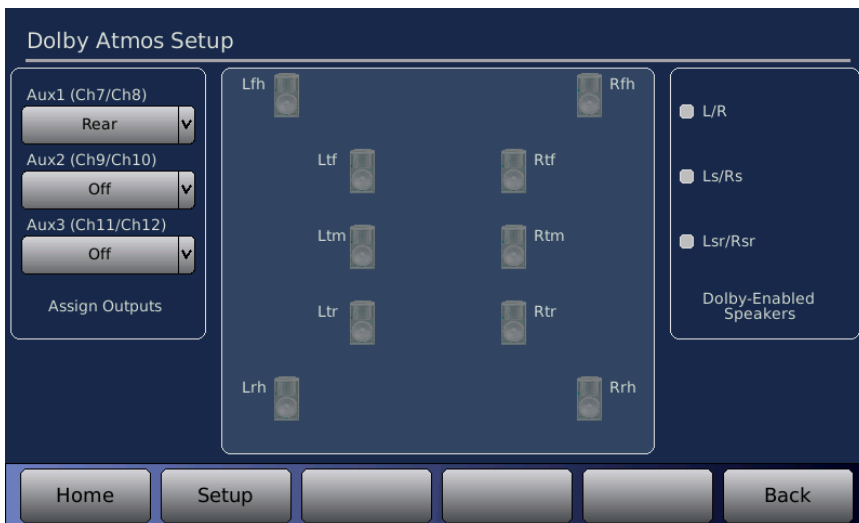

Figure 2 Dolby Atmos Setup Screen

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).

Aux 1 (Ch7/Ch8)	**Aux 2 (Ch9/Ch10)**	**Aux 3 (Ch11/Ch12)**
Off	Off	Off
Top Front	Front Height	Rear Height
Top Middle	Top Front	Top Front
Top Rear	Top Middle	Top Middle
	Top Rear	Top Rear

☑ Aux 1 assignment choices are not available when 6.1 or 7.1 is selected. The default "Rear" will appear which provides audio to the rear surround channels Lrs and Rrs on channels 7 and 8.

☑ Aux 1 and Aux 3 assignment choices are not available when 9.1W is selected, the default "Rear" will appear in Aux 1 for Channels 7 and 8, and "Front Wide" will appear in Aux 3 for Channels 11 and 12.

☑ If Aux channel locations have already been assigned to another Aux channel the choice will be grayed out and cannot be selected.

☑ Outputs listed with the Aux channels will also be the default channel output unless they are moved in the output routing screen.

Dolby Enabled Speakers. On the right side of the screen are selections for Dolby-Enabled Speakers (see Figure 2). Do not choose any of these selections 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 3. 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.
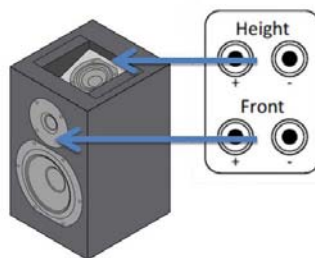

Figure 3 Dolby Enabled Speaker (DES)

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

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 **7.1**. This is done by using the pull-down menu selection as shown in Figure 1 (A)

Next select **Height Speaker Conf** (Figure 1 (C)), the menu screen in Figure 4 below should now appear.

Figure 4 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 5 Output Error Message

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 7.1 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.
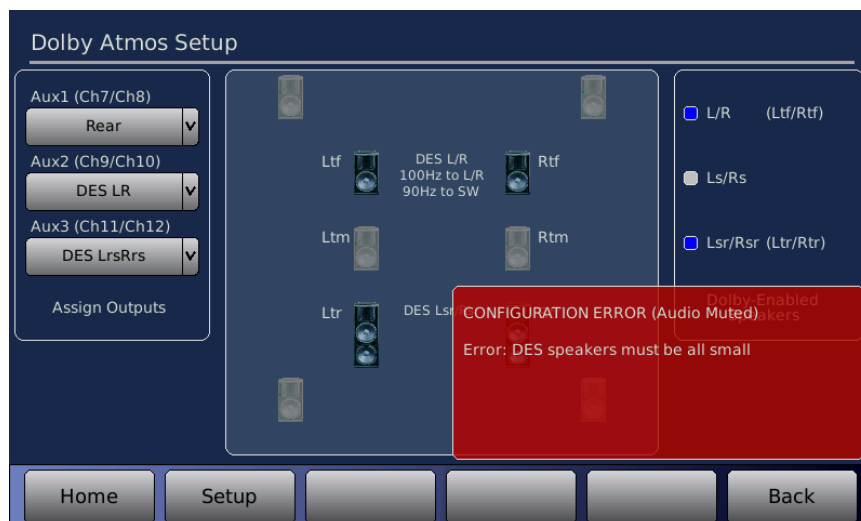
Figure 6 Error Message – DES speakers must be small

D. Set Channel Names. When all speakers have been assigned, select the **Set Chan Names** button to fill in the channel names menu (see Figure 1). This information will be seen on the **Home** screen VU meters.

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2. <u>Using the H693 Triggers</u>

The H693 card offers four 12V trigger out connections. These are 3.5mm mono jacks. The triggers may be used for automation functions such as powering on the amplifiers.
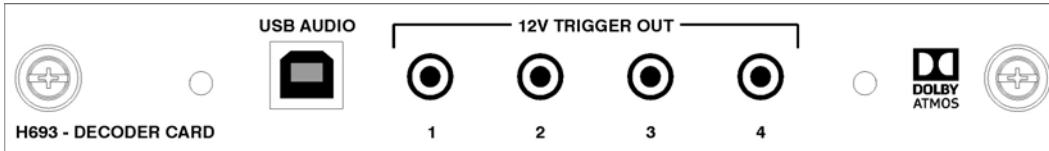

Figure 7. H693 Decoder Card

To use the triggers, an RS20i automation Macro must be added. For more information on creating Macros refer to the RS20i Installation and Operating Guide (*TM-H529 1.02* and above).

An example of a Macro created to **Power On** four devices is shown below in Figure 8. This triggers each device in sequence, with a 1 second delay between powering on each device.
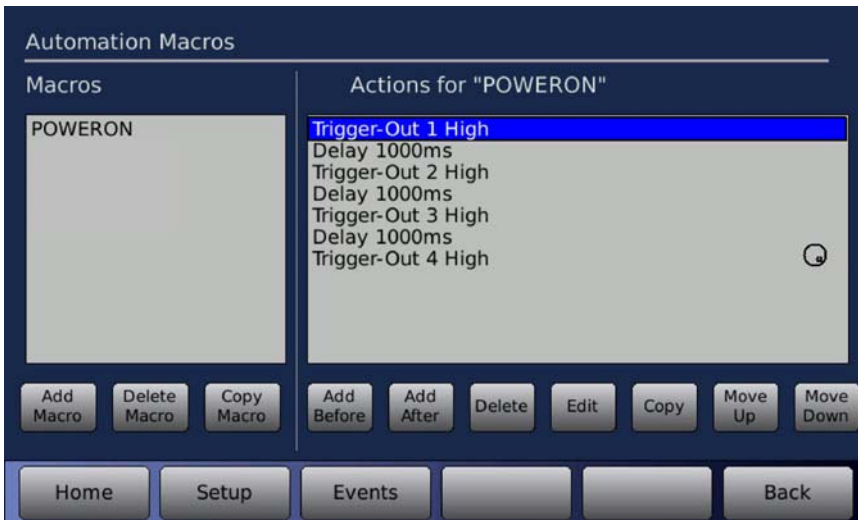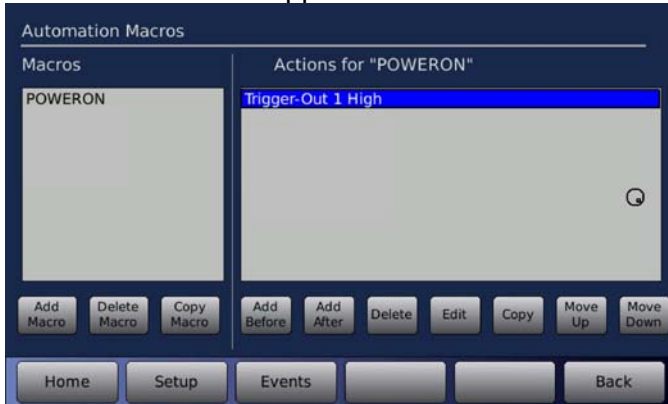

Figure 8. POWERON Macro

To create this Macro:

1. Select the **Add Macro** button. Type in "**POWERON**" when the keyboard appears. Select OK.
2. Select the **Add After** button on the Actions side of the screen. Select Action Type : **Trigger**, Execute: **Always**, Set Trigger-Out 1 to **High**. Select **OK**.
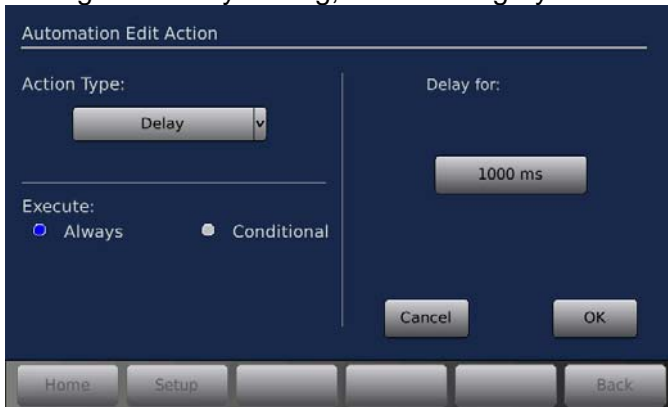
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3. The action will now appear on the Macro screen.

4. Select the **Add After** button. Select Action Type : **Delay**, Execute: **Always**, Delay for **1000ms** (to change the delay setting, click in the gray box and turn the front panel volume knob). Select **OK**.

5. Repeat the above steps for triggers 2-4.

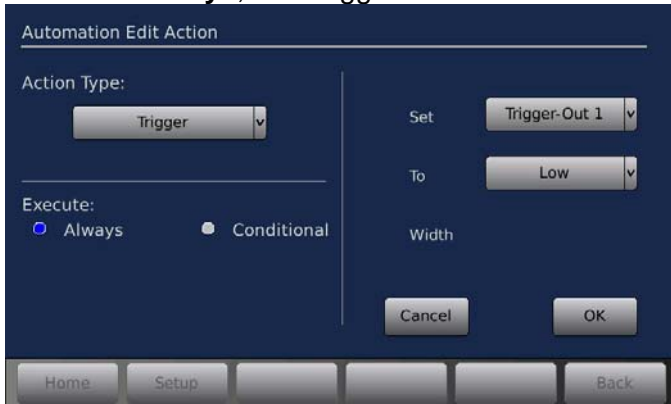An example of a Macro created to **Power Off** four devices is shown below in Figure 9.
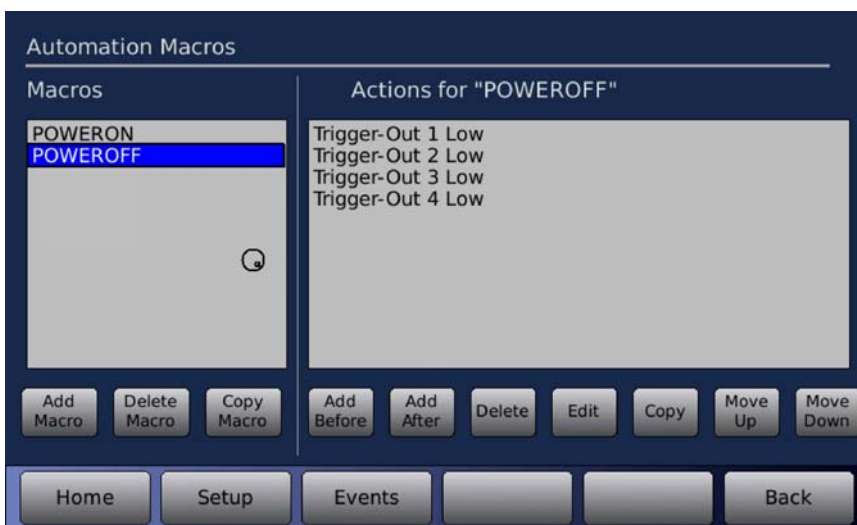
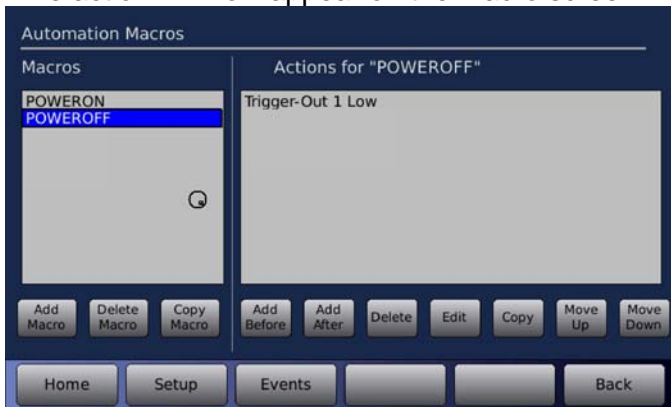Figure 9. POWEROFF Macro

To create this Macro:

1. Select the **Add Macro** button. Type in "**POWEROFF**" when the keyboard appears. Select **OK**.

2. Select the **Add After** button on the Actions side of the screen. Select Action Type : **Trigger**, Execute: **Always**, Set Trigger-Out 1 to **Low**. Select **OK**.

3. The action will now appear on the Macro screen.

4. Repeat the above steps for triggers 2-4.

3. H693 USB Audio Interface

The Datasat Audio USB interface runs in Class 2 mode. This allows playback of 24/192 audio. Windows requires installation of a driver to play 176 and 192 KHz audio over USB. Mac or Linux computers do not require installation of a driver.

Setting up USB Audio on a Mac

1. Connect the Datasat RS20i USB Audio input to the Mac.
2. On the Mac, go to **System Preferences > Sound**.

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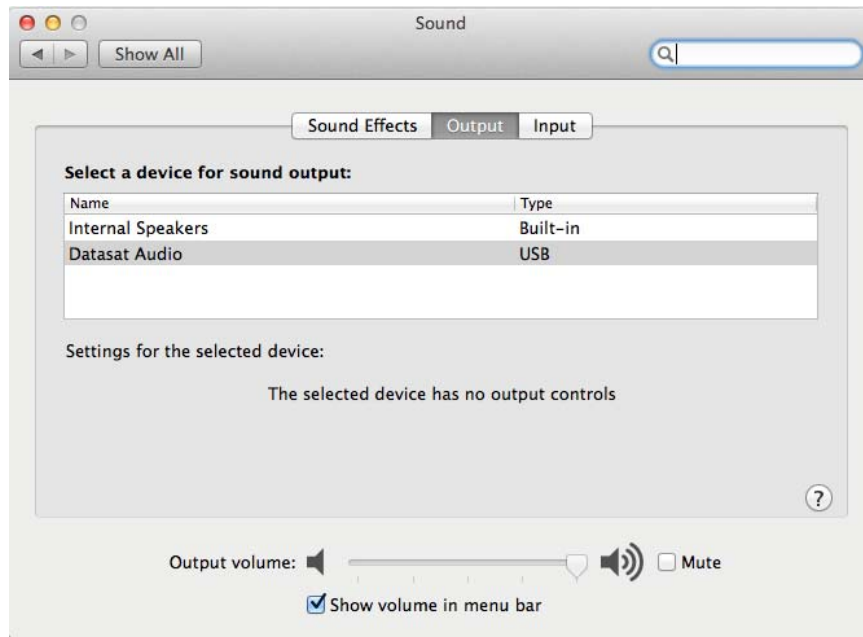| DEPARTMENT	CREATED BY:	EFFECTIVE DATE	REVIEWED BY:
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Figure 10

3. Select **Datasat Audio** as the **Output**. You may also need to select Datasat Audio as the playback device.
4. Start the Audio Midi Setup utility, which is located in **Applications > Utilities > Audio MIDI Setup (**Or type **audio** into the spotlight search and click on **Audio Midi Setup**).
5. Click on **Datasat Audio**. Set the audio output to the desired sample rate and choose the 2ch-24bit Integer or the 2ch-32bit Integer option. *Note*: Some audio players will adjust the sample rate to the source material.
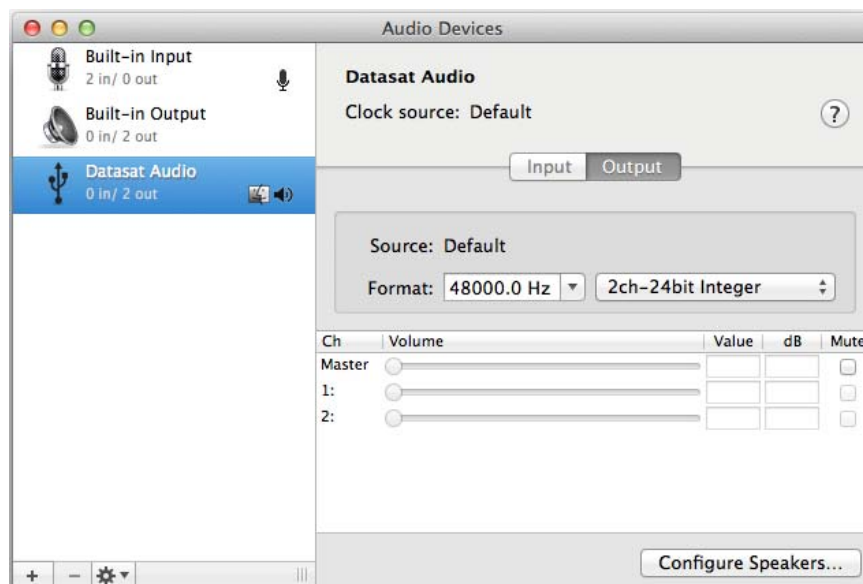

Figure 11

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6. Mac Options
In the **Sound Effects** window you may choose to have the OS X generated sounds come out of the Mac's internal speakers instead of over your USB audio sound system.
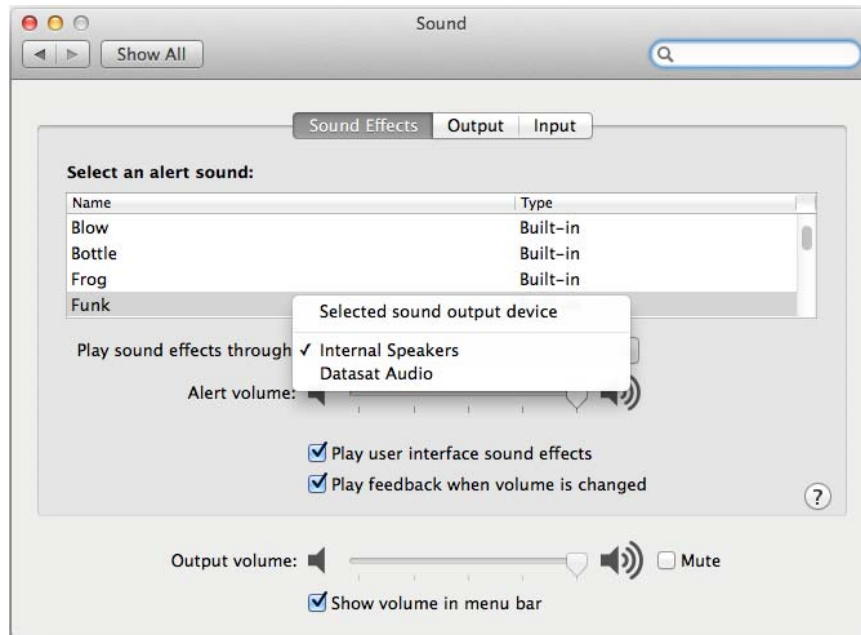

Figure 12

☑ Note: Options on OS X earlier than versions 10.6 may be different.

Setting up USB audio on a Windows PC

A Windows PC requires the installation of drivers to play audio at sample rates above 96 Khz. The Datasat USB drivers work with Windows 8, 7, Vista, and XP systems, though best performance is on Windows 7 and 8 machines.

Download the package Datasat_USB_1_03.zip for Windows 8, 7, and XP: Unified USB Drivers 1.03 (20MB)

Download the Windows Vista package Datasat_USB_1_03_Vista.zip: Vista Drivers 1.03 (7MB)

These packages can be found on the Datasat Digital Entertainment website www.datasatdigital.com in the RS20i support documents section under "Software".

Once you've downloaded the drivers, follow the steps below:

1. If an earlier 'CMEDIA USB 2.0 Audio Device' driver is installed on your computer, please uninstall it. (From Control Panel choose Programs and select Uninstall a program).
2. Unplug your Datasat USB input from the computer if it is connected.
3. Go to the download location of the Windows drivers
4. Extract the files from Datasat_USB_1.03.zip.
5. Click on the folder CM6631_6631A_-1.03(CR) to open it.
6. Connect your Datasat RS20i with a standard USB cable, preferably no longer than 2 meters.
7. Double-click on setup.exe. This will automatically select the correct driver for your version of Windows.

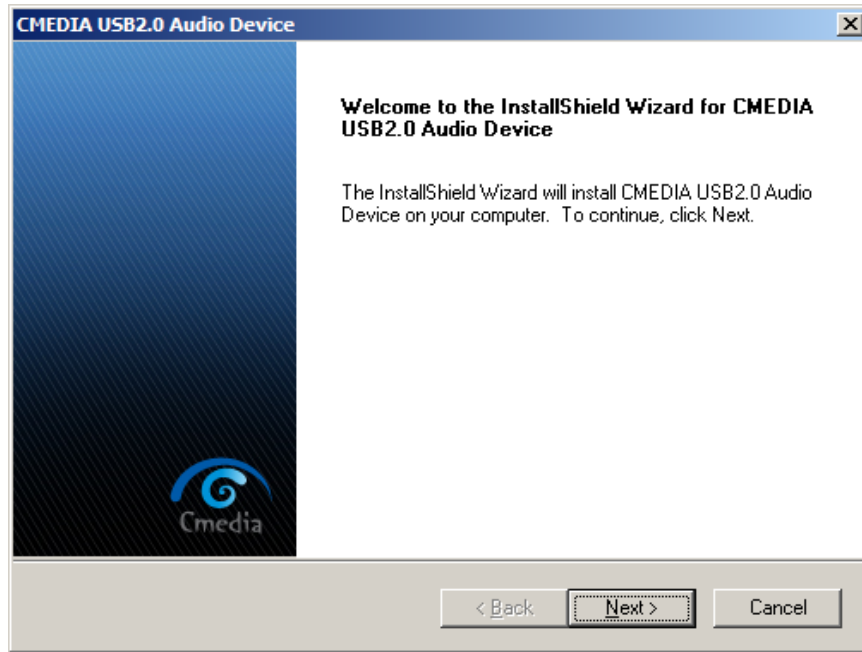| DEPARTMENT Engineering	CREATED BY: L. Brown	EFFECTIVE DATE June 8, 2017	REVIEWED BY:

Figure 13

8. Follow the prompts from the installation program to install the drivers. You may have to restart your computer.

9. In your Control Panel/Audio Devices, select Speakers: Datasat Audio. In Windows 7, select **Sound > Playback > Speakers**.
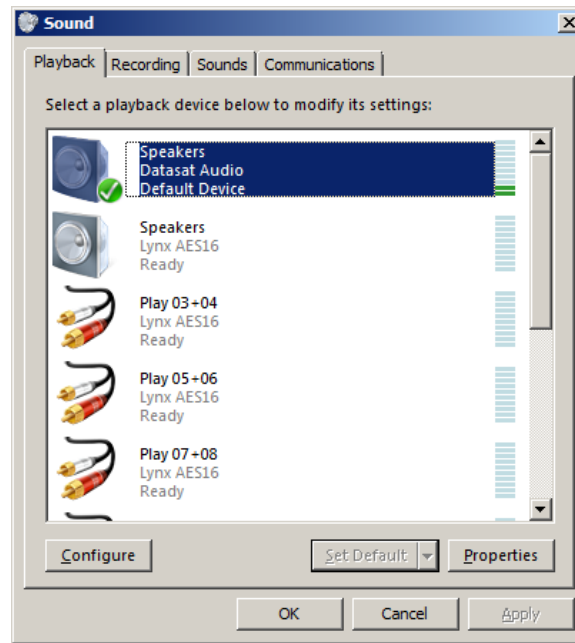

Figure 14

If desired, click the **Properties** button to choose the default sample rate output under the advanced tab. A 24 bit setting is recommended. Check the setting "Allow applications to take exclusive control of this device".

☑ Note: Some audio players will adjust the sample rate to the source material.

☑ Note: You may need to select the "Datasat Audio device" in the player software you are using to get output.

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