fiedler audio

Mastering Console

Manual

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1. What is Dolby Atmos

Dolby Atmos is a so-called object based audio format and it is designed for creating three-dimensional immersive audio mixes. Object based means that audio is not present in form of channels with a predefined position in space, like for example stereo, but in form of objects which can move around in space over time, among other things.

This also means that object based audio is not rendered to it's final playback format during production but on the playback side. So Dolby Atmos is delivered to the listeners agnostic of the format they listen to and only the playback device will then convert this Dolby Atmos stream or file to the actual listening format, be it a multichannel speaker setup, a smart speaker system or headphones.

So the idea behind Atmos is that you only have to create one mix and the playback system will render that mix in such a way that it sounds great on any reproduction system. There is no need to create a separate mix for each one of these different playback scenarios.

This is done by having metadata for the discrete channels (e.g. objects) encoded into the Dolby Atmos file and having the playback system mix those channels in the best way for each playback scenario. Since the playback system creates a mix based on your metadata, object based formats tend to be quite future proof and will even work well on playback systems which have not yet been invented.

Dolby Atmos can have up to 128 of such audio channels/objects, each encoded with its own metadata containing all the necessary information for playback systems to properly play back your content. At its core, Dolby Atmos has two kinds of channels: "bed channels" and "dynamic objects". Think of the bed as virtual speaker layout where you pan and place some of your tracks in your session. In Dolby Atmos, the standard bed format is 7.1.2, which means you have 7 speakers around you on the horizontal plane, one LFE channel for Low Frequency Effects, and two height speakers above you.

In addition to the bed channels, Dolby Atmos also has dynamic objects. This type of channel is designed to have the ability to change it's position over time and therefore it is treated differently during playback. Essentially, the playback system gives extra attention to these channels to make sure they are faithfully reproduced in space regardless of the playback system.

2. What is the Mastering Console?

The Mastering Console is the only Dolby Atmos mastering tool with plug-in-like modules built in, which let you conveniently process the entire Dolby Atmos mix to give it the final touch, on Mac and on Windows. It is fully certified and approved by Dolby Labs and the imported and finalized Dolby Atmos mix can be exported as a legit Dolby Atmos ADM/BWF file and re-renders.

The Mastering Console offers features for your Dolby Atmos mastering workflow you will not find in any other solution. The most prominent among them are the following:

- Easy edit of channel metadata (Binaural Mode, Description, Groups) and program level metadata (Downmix, Trim, Balance etc.)

- The Master Channel allows you to load plug-in-like modules to process the entire Dolby Atmos mix, just like you would process your stereo mix by putting plug-ins on the master track.

- Preset based hardware routing & room tuning for most flexible monitoring.

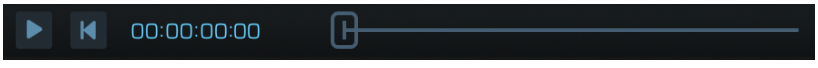
- Fast loudness measuring of the imported file including all the edits.

3. Overview

When starting the Mastering Console the initial screen is quite empty and you have to load an ADM/BWF file first before you can do anything.

Below the initially empty main screen are the four buttons giving you access to the four different pages, the Monitoring section, the Channel Configuration, the Master Channel and the Options page. Since nothing is loaded, they are inactive.

After loading an ADM/BWF file these buttons become active and the pages show all the elements for monitoring, editing and exporting your work. Also, playback controls become visible.



Apart from playing back, either by clicking the play button or hitting the space key, you can move the playback pointer to any place of your loaded file to play back the desired section.

Monitoring page

The first of the four pages is the monitoring page. It is split into two parts. To the left are the meters for all possible 128 channels of the imported Dolby Atmos mix. The orange channels are bed channels, the blue channels are dynamic objects.

On the right side of the monitoring page you see the controls for monitoring level, Dim and Mute. You can select the speaker layout and the headphone layout as well as a personalized HRTF file.

Below that you find the button for opening the Audio Device Setup where you can select your audio device as well as setup your routing and your room tuning.

Channel Configuration page

On the second page you find the Channel Configuration list containing all channels in your imported Dolby Atmos mix. Again, bed channels are orange and dynamic objects are blue. On this page you can adjust various channel related parameters, such as Binaural Mode, Description and Group assignment.

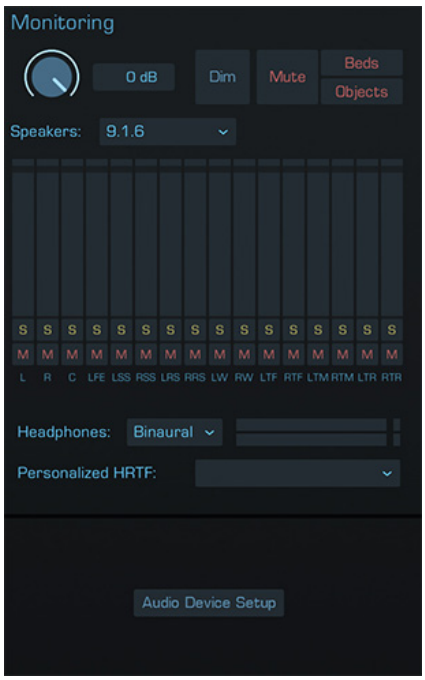
Master Channel page

The third page is the Master Channel where you can load modules to process your Dolby Atmos mix as a whole. Below the list of the modules is the Master Gain knob and the Loudness measurement section.

Options page

The last of the four pages is the Options page where you can adjust global settings for your Dolby Atmos mix, the so called Program Level Metadata. Here you can also manage Groups, set the desired file formats for exporting your mix and unload the currently loaded ADM/BWF file before starting to work on the next one.

4. Monitoring



With the top controls you can set the monitoring volume, dim the monitoring with one click, mute the whole Atmos mix or mute either the beds or the dynamic objects.

With the Mastering Console you can monitor through a speaker layout and through headphones simultaneously. In the Audio Device Setup you can set the routing for both monitoring paths as you need it. More about this in the chapter about **Audio Device Setup**.

In the same section you can also select the personalized HRTF file for binaural monitoring. The Mastering Console currently only accepts PHRTF files created with Dolby's own PHRTF creator app which can be downloaded for free from the Appstore. SOFA files or other formats are currently not supported.

The PHRTF files must be copied to a specific folder depending on the OS your are working on:
Mac: */Library/Application Support/Fiedler Audio/Atmos Composer/PHRTF*
Windows: *C:\Program Files\Common Files\Fiedler Audio\Atmos Composer\PHRTF*

HRTF stands for head related transfer function and basically describes how sounds coming from different directions should sound when they reach your ears based on the geometrical properties of your head. But keep in mind that other people do not have your PHRTF, so be sure to perform a binaural quality check without using any PHRTF.

5. Channel configuration & program level metadata

On the Channel Configuration page you have access to the channel related features of Dolby Atmos. In the Binaural Mode column you can change how each channel is rendered when listening to your mix in binaural. Dolby Atmos offers 4 different options for each channel. "Off" means that no binaural processing is applied to the channel while the remaining three modes differ in the perceived distance.

As a side note, with the current implementation of Apple Spatial Audio, Apple's way of Dolby Atmos reproduction on headphones, these settings unfortunately are ignored because the Apple algorithm basically renders your mix first to the 7.1.4. speaker setup and then converts that to binaural.

In the Description column you can input an arbitrary text for describing the content of the channel. This text however is the same for all channels belonging to a bed.

In the Group column you can select a group for each channel from a predefined list of groups. This list can be changed on the Options page. The group must be the same for all channels belonging to a bed.

On the top right corner of the Options page you can see the place where you can manage the available groups. The names can be arbitrary and you can add and remove groups as you see fit.

To the left of the groups management section is a set of controls which allows you to change how the imported mix will be rendered on certain speaker layouts. The first two dropdown menus let you choose the algorithm for downmixing from 5.1 to stereo and from 7.x to 5.1 and 5.1.x. This is used for monitoring and when exporting your master to a multichannel wave file. To exactly know what these algorithms do please refer to the Additional information section of this manual.

Below that you find the controls to set trim and balance values for five different speaker layouts. First you need to select which layout you'll be editing using the dropdown menu.

If the "Automatic" button right to the dropdown menu is switched on, the Dolby Atmos renderer sets these values internally and the knobs are greyed out. If the button is switched off, the knobs become available for manual adjustment.

The Trim knobs are attenuations in dB. One knob sets the attenuation for the surround speakers while the other sets the attenuation for the speakers in the upper plane, or "height" speakers. All associated "surround" and "height" speakers are attenuated equally by the values set here.

The balance values are in percent and determine the front-to-back balancing ratio. This applies to both the ear-level listener plane and for the overhead "height" plane. Positive values emphasize the front while negative values emphasize the back.

Below that are the three master settings: Sample Rate, Frame Rate and Timecode start.

"Sample Rate" cannot be changed but is determined by the loaded ADM/BWF file. If there is a mismatch between the sample rate of the loaded file and the sample rate of your audio device, an error message becomes visible and you have to switch to the correct sample rate in the Audio Device Setup. It is also worth mentioning here that the optimal buffer size you should set the Mastering Console to is 512 samples if you are working in 48 kHz or 1024 samples if you are working in 96 kHz.

The frame rate cannot be changed either and is only displayed for informational purposes.

"Timecode start" can be changed though.

6. Mix processing with the Master Channel

The Master Channel sits directly before the Dolby Atmos renderer and all channels of the loaded ADM/BWF file pass through the modules and Master Gain before hitting the renderer.

Use the "Add Module" button to add a module and the "Remove Module" to remove a selected module from the chain. With the arrow buttons further right you can move a selected module up or down in the chain. Right to the arrow buttons you find an initially empty field and by clicking on it you can load previously saved module chains as a preset. With the "hamburger" button you can save and otherwise manage those module chain presets.

Once a module is added, it is automatically given a name, which of course you can change to whatever you like. Next to the name field, you see the buttons for opening the editor of the module and for bypassing or deactivating the module.

7. Loudness measurement

On the Master Channel page you find the loudness measurement section at the bottom. Before you can start measuring you first need to select the right format. After that, measurement starts as soon as sound passes through.

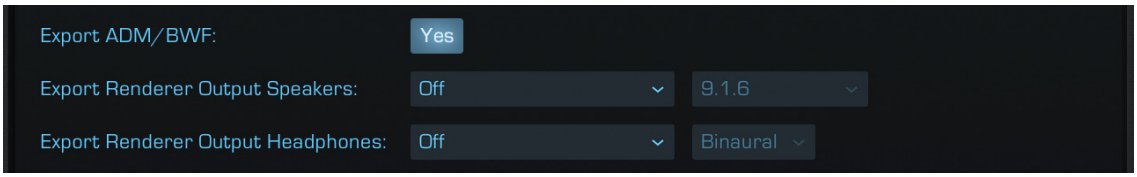
Before checking your mix for compliance with the distributor's requirements please do not forget to reset the measurement using the "Reset" button adjacent to the format selector in case you measure via playback. Then you need to play your song from start to finish without stopping to get the right values for measuring.

A faster and even better way to measure the loudness is using the "Measure ADM" button. Simply by clicking this button you can measure the loudness of your imported file including all the modules and Master Gain to quickly check for compliance with the distributor's requirements. You do not need to click "Reset" before.

Of the five values shown here, integrated loudness and true peak are the most important. The integrated loudness must be calibrated to a certain target value a distributor may require you to match before they accept delivery while true peak shows you if there is any level overshoot.

8. Export

For exporting you first have to tell the Mastering Console what formats you want to export. You can export the ADM/BWF file and/or the speaker output and/or the headphone output and you can select that on the Options page.



All of these export options can be selected simultaneously and you will obviously need at least one for the export to work. By default ADM/BWF is selected which is the delivery format of your Dolby Atmos master.

The speakers and the headphones renderer outputs can be set to export as one single multichannel file or as a set of mono files, one for each channel. Once you have selected one of the two options, you can then select your desired format. This will switch the renderer to the selected format and monitoring will also be set to this format. You can see this on the monitoring tab accordingly. So, if you have exported to a different format than what you normally use for monitoring, you may need to switch this back to your normal monitoring format before carrying on with the mastering process.

Now you just hit the "Export" button, select a filename and the export process will be done at maximum speed. If you choose to export the renderer output, be it speakers or headphones, an appendix is added to the selected filename indicating the content of the exported files.

When you are done working with the imported file, just click "unload" on the Options page and the Mastering Console switches back to the initial state where you can import another file to continue working.

9. Audio Device Setup

Clicking on the "Audio Device Setup" button on the monitoring page opens a dialog window where you can select your audio device and adjust various settings for it.

Depending on the sample rate of your ADM/BWF file, you'll need to select either 96 kHz, preferably with a 1024 sample buffer or 48 kHz preferably with a 512 sample buffer. If you load an ADM/BWF file that doesn't have the same sample rate that is currently set for your audio device, an error will be shown and you will have to adjust the sample rate here before being able to actually work on your imported file.

Below the basic audio device settings, we have the routing settings on the left. By default, the preset for Headphones is loaded, where the headphone channels are routed to outputs 1 and 2. There are a lot of different presets with useful settings. You can also create your own presets and save them for later use, if you like.

If you accidentally forget to save your settings as a preset and close the app, not to worry. The settings from the last session will be restored when opening the Mastering Console again so you can still save them if you want.

The Routing List below the preset selector contains all possible channels at the output of the Dolby Atmos rendering algorithm. You can use the drop down menus to decide which output of your audio device will receive each Atmos channel.

For example in the image above a preset labeled "9.1.6 with Headphones" is loaded.

In that preset the 16 channels of the 9.1.6 layout are routed to outputs 1 to 16 of our audio device. Left Surround and Right Surround for 5.1.x layouts are routed to output 5 and 6 which is where our side speakers are already routed.

The preset has been set in this way so that you can listen to 5.1.x layouts on your 9.1.6 setup and you can check how a downmix of your Atmos mix will sound. In this case, the surround channels of the 5.1.x monitoring format will be routed to the side surround speakers of your 9.1.6 setup.

This means you can practically choose any listening format on the Monitoring page and the speakers of the selected format will automatically be routed to the correct speakers of your setup. On the bottom of the list, we see that the headphones are routed to channels 17 and 18, which lets you have headphones connected and working in parallel to your speaker monitoring system.

To the right of the Routing section, you'll find the Tuning section where you can set a volume, a delay time and an EQ curve for each and every channel, except for the headphones. By default, this section is turned off for performance reasons, but if you need to use it for your speaker calibration, you can switch it on and start tweaking.

As you can see, there is a preset loaded called "Flat", where all EQs are set to flat, the volumes are at 0 dB and the delay times are at 0 ms. A tuning preset always contains all tuning settings for all channels. When Tuning is switched on, you can select a channel in the routing section and the tuning parameters for that channel become accessible. Now you can set the volume, delay time and EQ curve for that channel.

To help you measure your speakers, we have included a Signal Generator on the bottom. Here you can select different test signals, such as pink noise, different sine wave tones, a transient thumping sound and a sine sweep in case you want to generate an impulse response from which an entire frequency curve can be generated. For generating an impulse response, you'll need additional equipment and software as this function is not part of the Mixing Console.

The buttons on the right side below the EQ let you reset the EQ with one click or copy and paste the EQ settings from one channel to another.

Again, the tuning settings will also be saved upon closing the Mastering Console and restored the next time you open the app again. You can also save the tuning settings to a preset and thus have different tunings at hand when you need to switch between studios.

10. Additional information

System Requirements

Supported Operating Systems:	macOS 10.14 through 14 / Windows 10, 11
CPU:	Intel min. 2 GHz, x64 with at least SSE3 support, or Apple Silicon M1 or higher
Display/Graphics:	min. 1440 x 900 px, OpenGL 3.3 or newer
Memory:	min. 4 GB RAM

Description of 5.1 and 5.1.x downmix options

- "Standard (Lo/Ro) - default" - downmix to 7.1 and then to 5.1 using the coefficients:
  * Ls = 0 dB × LSS + 0 dB × LRS
  * Rs = 0 dB × RSS + 0 dB × RRS

- "Dolby Pro Logic IIx" - downmix to 7.1 and then to 5.1 using the coefficients:
  * Ls = LSS + (–1.2 dB × LRS) + (–6.2 dB × RRS)
  * Rs = RSS + (–6.2 dB × LRS) + (–1.2 dB × RRS)

- "Direct Render with room balance" - Renders from Dolby Atmos to 5.1 directly applying an updated Dolby rendering algorithm that reduces the comb filter effects associated with phantom imaging of objects positioned halfway between the front and rear of the room. Room balance refers to how the Renderer deals with content that is panned between the midpoint and rear of the room. With this setting, the content is presented at a constant level in the surround speakers between the rear and midpoint of the room, avoiding any need for phantom imaging until it is in the front half of the room.

- "Direct render" - Renders from Dolby Atmos to 5.1 directly accurately re-creating the sound field at the central listening position using phantom imaging between the surround speakers and front speakers.

Description of the 5.1 to 2.0 downmix options

The coefficients for the two-channel downmixes from 5.1.x are:

- "LoRo"
  * Lo = L + (–3 dB × C) + (–3 dB × LS)
  * Ro = R + (–3 dB × C) + (–3 dB × RS)

- "Lt/Rt (Pro Logic II) and Lt/Rt (Pro Logic II) w/Phase 90"
  * Lt = L + (–3 dB × C) – (–1.2 dB × LS) – (–6.2 dB × RS)
  * Rt = R + (–3 dB × C) + (–6.2 dB × LS) + (–1.2 dB × RS)

The phase 90 filter used provides the all-pass 90-degree phase-shift filtering for the LS/RS feeds into the downmix, which reduces undesirable signal cancellation, improves imaging, and enables proper matrix decoding. It is strongly recommended to
use the 90-degree phase shift for any Lt/Rt downmixes.

11. Video Tutorials

Check out our video tutorials on our YouTube channel.

Channel: youtube.com/@fiedler-audio

Mastering Console tutorial: Mastering Console tutorial

12. Trial & Purchasing

After downloading the installer and installing the software you have a 14 day trial period. The software is fully functional during the trial period. To start the trial period you need to click "Try" on the about screen of the software which opens automatically upon opening the app. On the about screen you can also see the remaining days of your trial. The about screen can be opened manually by clicking on the product logo or on the fiedler audio logo.

The above mentioned way to start your trial requires an active internet connection. If for some reason you do not have an internet connection on the computer you are using for your trial you will instead be prompted with a way to start your trial offline. The dialog windows which open will guide you through this process which is basically a challenge & response type activation. You will first have to save a file called "comp-id.xml" which contains a digital fingerprint of your computer. This file you have to upload to our website to get the response file with which you can then start the trial offline by loading it into the software in step 2 of the whole process.

Once the trial period ends the software stops working and you need to activate it with a serial number. To purchase a license please visit our website and click on the "Buy Now" button of the desired product. A popup will open and you will be able to make your purchase. The payment options offered depend on the country and the purchase is processed through Fastspring (www.fastspring.com).

After successful payment the serial number will be sent to you automatically via email. If you are planning to buy several different products please check out our bundles to get discounts.

Note: If the trial period has expired but you didn't have the chance to properly evaluate the software, you can request an additional trial period by contacting us through the contact form on our homepage. You will then get a trial extension serial number which you have to copy into the serial number field on the about page and hit "Try" (not Activate!).

13. Activating & Moving your licenses

After purchasing the software you will receive a serial number via email. To activate the software just copy the serial number, paste it into the license number field on the about screen and hit "Activate". The window will close automatically and the software is activated. A regular license allows simultaneous activation on two computers.

For that process to work you need an active internet connection. If for some reason you do not have an internet connection on the computer you want to activate you will instead be prompted with a way to start your offline activation. The dialog windows which open will guide you through this process which is basically a challenge & response type activation. You will first have to save a file called "comp-id.xml" which contains a digital fingerprint of your computer. This file you have to upload to our website to get the response file with which you can then activate offline by loading it into the software in step 2 of the whole process.

If you need to move your license to another computer you can deactivate the software to free one of the seats of your license on the old machine and then activate it on the new computer. To do so please open the about screen of the software on the old machine by clicking on the product logo or the fiedler audio logo and then click onto the "Deactivate" button. Again, this works out of the box with an active internet connection but if you do not have an active internet connection on this system you will have to go through the same process with challenge and response as you would have with activation. There is no limit regarding the amount of deactivations so you can move freely between machines.

IMPORTANT: Uninstalling the software does NOT deactivate it. If you have not deactivated the license as described above, the license is still active on that machine.

14. Modifier keys

Knobs and sliders can be dragged in a fine tuned way using Shift Key and/or Cmd/Ctrl Key. Both Shift and Cmd/Ctrl can be combined for an even finer control.

Double click on a Slider or Knob resets it to it's default value.

In the gravitas MDS module you can edit the value of a slider or knob by right-clicking on it.

Hovering with the mouse over knobs, buttons, sliders etc. reveal quick hints about their functions.

15. Support

If you need help with operating our software please check out our video tutorials, the knowledge base on our homepage and don't hesitate to contact us through the contact form on our homepage.

If you think that you have encountered a bug in our software please first make sure that you have the latest version installed. You can check the version of the software on the about screen. The about screen can be opened by either clicking on the product logo or on the fiedler audio logo in the editor. If you are on the latest version and the bug is still present please contact us through the contact form on our homepage. Please provide information about the software you are using, the operating system, the main hardware specs of your computer and a detailed description of how to reproduce the bug if possible. Thanks in advance!

16. Installation & deinstallation

When installing the software, the installation program will copy the software into the appropriate application folder.

If you want to uninstall our software you can do so on Windows using the Control Panel.

On macOS, the software is installed in the standard */Applications* folder. To uninstall the software on macOS you have to manually delete it from this folder. To also delete the presets and other settings you have to go to the folders
/Library/Application Support/Fiedler Audio and
~/Library/Application Support/Fiedler Audio
and delete the appropriate folder(s) inside.

Note: Since OS X 10.7 (Lion), the system and user Library folders are marked as hidden by default. To make them visible again in Finder, open Terminal (found in /Applications/Utilities) and enter the following commands:

chflags nohidden /Library
chflags nohidden ~/Library

17. Acknowledgements

A huge thanks to all our beta testers for their relentless testing of the different beta versions! Special thanks go to Thomas Wendt for making our software visible to the world.

Furthermore we would like to thank all our users for their support and loyalty over the years. You have made all this possible.

18. About fiedler audio

Fiedler Audio was founded 2013, with the goal of delivering the highest quality products for musicians, audio engineers and sound designers. We are dedicated to the creation of professional music and audio software that expands the horizons of musicians, DJ's, audio engineers and producers. Our greatest desire is to enable amateurs and professionals alike to realize their dreams and ideas at the highest level, wherever they may be – whether in the studio, at a gig, in the comfort of their living room or in the park, our software offers new and innovative ways to evolve.