Mixdown for Mastering Tips

Plug-ins on the Master Output

If you are using plug-ins on the master output during mixing, then export two versions: A) one version with plug-ins enabled on the master output, and B) one version with plug-ins bypassed on the master output. Limiting or clipping should always be avoided on mixdowns for mastering.


A One version with plug-ins enabled on the master output - except limiter or clipping.
B One version with plug-ins bypassed on the master output.

💡 Having two mix versions gives me a choice in case you over-processed the mix. Check that your mix does not exceed the headroom when bypassing the plug-ins. If the master bus is overloading after bypassing the plug-ins, simply lower the master fader. Do not bypass plug-ins on individual channels in the mix.

Headroom

Your 24 bit mix should have its highest peak between -12 dBFS and -3 dBFS. This translates to between 12 and 3 dB of headroom before exceeding the digital ceiling of 0 dBFS. If you are recording an analog mix into your DAW follow example B below.
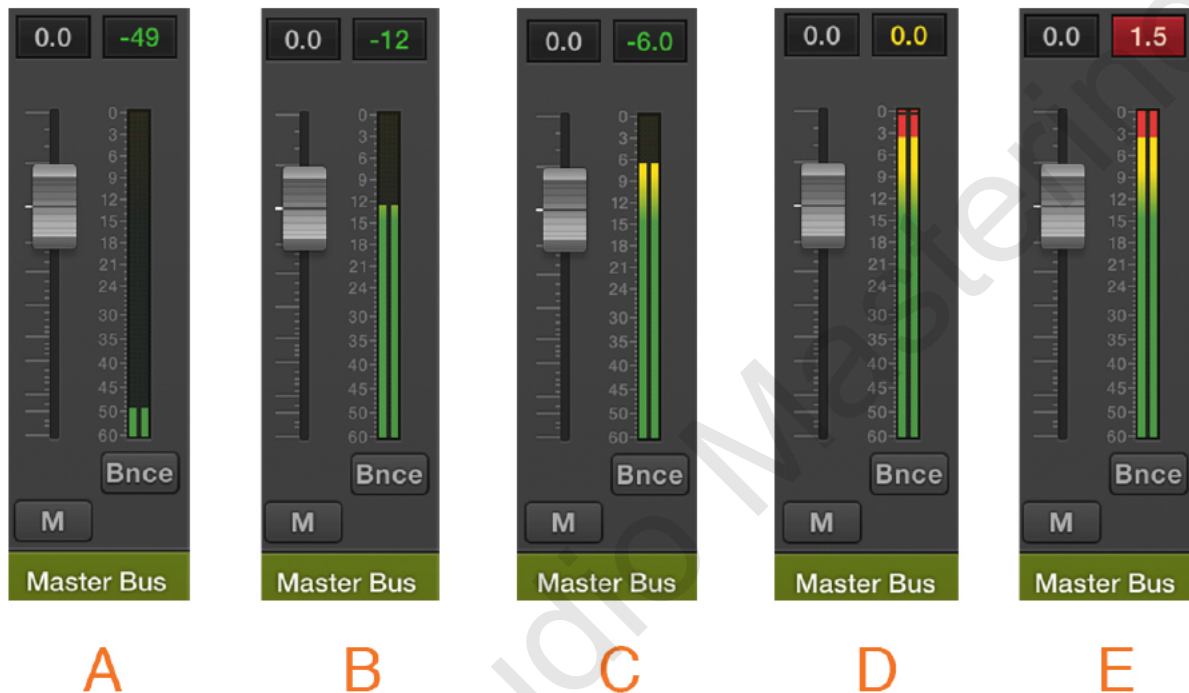
A Very low signal results in low resolution. Not optimum for quality mastering.
B The highest peak is somewhere between -12 and - 6 dBFS. Perfect for mastering.
C The highest peak is somewhere between -6 and - 3 dBFS. is acceptable for mastering.
D Peaking at 0 dBFS is not desirable though still usable.
E Overloading (clipping) the mix makes it unusable for quality mastering.

💡 Headroom is the amount of dB before your mix clips and the overload indicator lights up on your master output. If your mix is too loud then simply lower the output fader until the highest peak is within the recommended range. Sound quality will not be affected when you lower the fader. With 24 bits you can go as low as -48 dBFS and still have full CD quality (16 bit). However, once you exceed the digital ceiling, distortion will occur, and it will not be possible to restore the original quality. There is no reason to maximize the volume during mixdown. I will make sure your song reaches its maximum loudness potential later in the mastering process.

Tips for Mixing - From a Mastering Point of View
The following issues can be fixed with greater success in the mixing process than in the mastering process. Make sure you pay extra attention to these points:

Noise
With analog recordings (guitar, drums, etc.) or completely analog mixes, use the mute automation function in your sequencer or on your mixer to eliminate hiss noise. Mute individual channels or groups when they are not active. This is particularly important in the intro, breakdown, and outro since it will reduce the level of noise in the parts of the song where it is most audible.

Phase and polarity
Check to see if recorded drums are out of phase. Other common problems are synthesizer sounds with too much anti-phase and applying a fake stereo spreader. Check your mix in mono playback to see if sounds almost or entirely disappear because of inverted polarity.

Correlation Meter

ᗧ Most professional sequencers include a correlation meter to check for phase problems. When the meter is indicating a value towards +1 the sound is in phase. When the meter value is towards -1 the sound is out of phase. A value of exactly -1 means you have inverted the polarity, which will make it disappear completely in mono playback.

Sub frequencies
Loud or unnecessary sub frequencies (below 40 Hz) in individual tracks can cause problems with the sound quality and the final volume of the master. Consider low cutting tracks that do not contain meaningful sound in the sub frequencies. For instance, a vocal can be cut at around 80 Hz to avoid pops or rumble. Using a gentle 12 dB/Octave slope will sound more natural than a steep filter. Do not cut the entire mix though as this could lead to a thin sounding mix if you are not careful.

Sibilants and other sharp sounds
Sibilants and other sharp whistling or clicking sounds from the mouth or string instruments are a serious challenge when mastering. Use a de-esser if necessary, preferably *not* a narrow band de-esser since it can cause lisping artifacts. Use volume automation on very loud sibilants, plosives, or click sounds. Also pay attention to other sharp sounds that stick out, i.e. crash cymbals and hi-hats.

Vocal levels
An uneven vocal is difficult to fix in the mastering process. Sometimes two compressors with a low ratio is better than one compressor with a high ratio. Even with correct vocal compression you often still need to do volume automation. Turn individual passages or words up or down until everything is smooth and clearly audible. Try listening at a low volume while adjusting the volume automation on the vocal track.
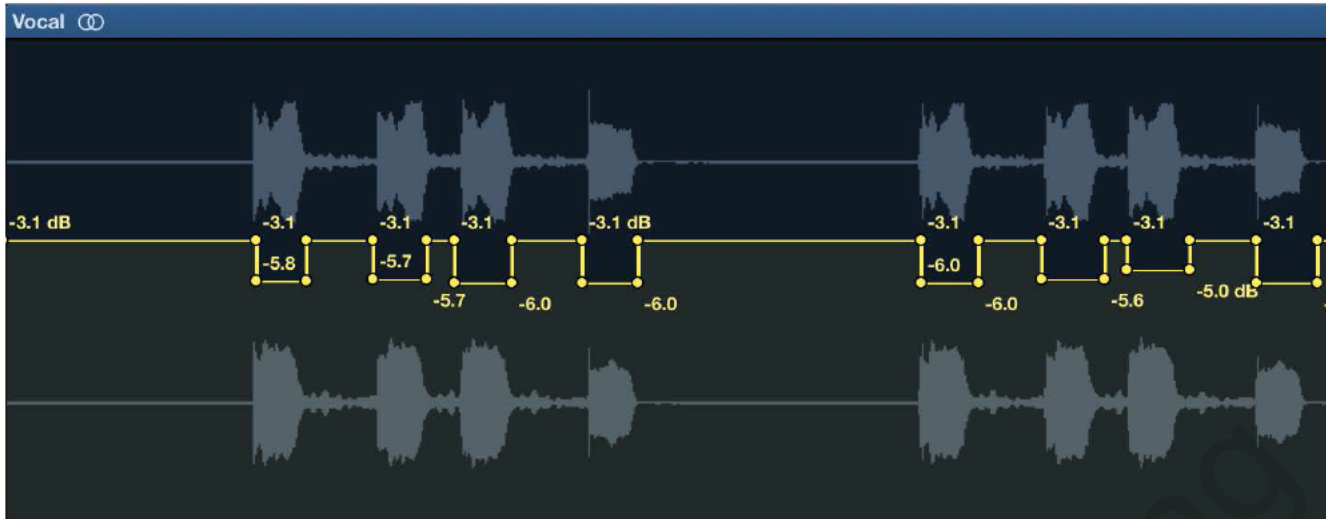
Volume automation on the vocal track

Alternative Versions

It is common practice to provide alternative versions of the mix with vocals up (or down), e.g. +0.6 dB or +1 dB, as well as an instrumental and a capella version. Sometimes you make a version with a louder kick and/or snare drum. You do not have to send these right away, but having them available is a good idea.
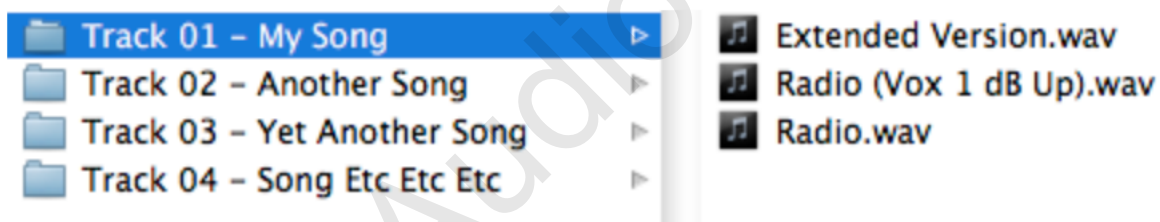
Use clearly labeled file names to avoid confusion

💡 Clearly write the difference in the file name itself and in the notes. Everything else in the file should be 100% identical to the normal version, so do not adjust the master fader. If necessary I can choose from the alternative versions or splice parts later. If you ask me for a mix check before delivering the final mix then alternative versions are rarely needed. Many record companies insist on having the alternative versions, so be prepared.

Most professional sequencers have an easy way of offsetting automation. This makes bouncing alternative versions a breeze. In Logic Pro 9 you hold down the Command key while dragging the vertical yellow automation bar up or down. For other sequencers please refer to your manual.

Alternatively, you can use the output gain in the last plug-in on the track channel to raise or lower the output level. If you are outputting or sending the channel to a bus with dynamic processing or if your are using the channel for sidechaining, you can not use this alternative method.

Command + drag the yellow bar to offset volume automation in Logic Pro

Start/End

Export your mix at least one bar before it actually starts. Include a couple of extra bars at the end to ensure reverbs, delays, and instrument decays have tapered off completely.
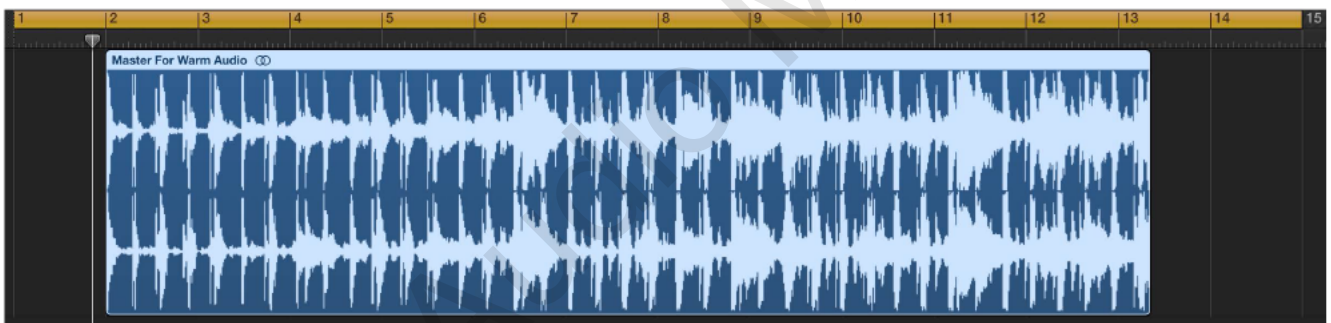
Include empty space at the start and the end of the song

Fades

Do not fade out the end of the mix. Instead, tell me where the fade should begin and end. Write down the fade times in absolute or relative terms, i.e. "fade out from 3:15 to 3:30" or "fade the last 15 seconds of the song".

File Format

WAV or AIFF is preferred.

💡 The WAV format can also be referred to as BWF (Broadcast Wave Format). Both WAV and AIFF is a so-called PCM (Pulse Code Modulation) format, and are identical in sound. The SDII and CAF formats are also PCM but are not used for mixdowns for mastering.

Stereo Format

Choose interleaved stereo and not split stereo when bouncing or exporting your mixdown for mastering.

 If your sequencer does not give you a choice of stereo format then it is most likely using interleaved stereo. Interleaved stereo uses one single stereo file. Split stereo uses two individual mono files, something that does not suit the mastering workflow.

Bit Resolution

24 bit.

 16 bit files are only used whenever it is not possible to get a 24 bit file of the same mix. All professional sequencers are able to export in 24 bit, but some hard disk recorders only burn audio CDs (which are always 16 bit). 32 bit floating point is not commonly used for mixdowns for mastering. The actual sound contents of a 32 bit float file is virtually identical to that of the 24 bit fixed format, it takes up more space, and is slower to data transfer.

Sample Rate

44.1 kHz or higher.

 Only export in higher sample rates than 44.1 kHz if your project is actually recorded and processed at that rate. The advantages and disadvantages of using higher sample rates are debatable. If your project contains different sample rates then do not convert sample rates yourself, let the me do it. If you need to put your master in a movie or you require a different target sample rate than 44.1 kHz, then tell me in advance.

Dithering and Noise Shaping

Do not use noise shaping or colored dither, e.g. UV22 or POW-r when exporting your mixdown for mastering.

 In very rare cases noise shaping can cause high frequency artifacts during the mastering process. You can use flat dither during the mixdown, referred to as TPDF. In all circumstances dithering and noise shaping on a 24 bit file has very little effect on the sound, so leave if off if you are uncertain. The final bit reduction to 16 bit (audio CD format) is performed by me as the last step of the mastering process.

Normalizing

Do not use any kind of normalizing on your mixdown.

 Normalizing raises the signal level in an unnecessary fashion, and it will change the amount of headroom left in the mix. Instead the final volume level of the mix will be optimized by me.

Realtime or Offline Bouncing

In theory a realtime and offline bounce are identical. However, sometimes track automation and unsynchronized LFO's are not identical due to small timing differences. If you decide to do an offline bounce then listen to the full bounce before sending it to me.

Listen to Your Mixdown

Always listen to the exported file from the beginning to the end before sending. Make sure everything is playing correctly, that the beginning and end are intact, and that no artifacts or click sounds occur.

Here are some common problems and solutions:

The mix is overloading/clipping

Your master output is too loud. Simply turn down the master fader. There will be no loss of quality as long as you follow the advice given in this document.

Plug-ins are active on the master output

Make one mix with plug-ins and one without plug-ins on the master output.

The intro has a click or overlapping reverb/delay tails

This is caused by a missing reset buffer command in the sequencer or 3rd party plug-in. Add a small piece of dummy audio at the beginning of problematic tracks. This will trigger the buffer error before the actual song starts. Make sure there is at least one empty bar before the music starts.

The reverb, delay or instrument tail is missing at the end of the song

Export your song with at least one extra bar at the end.

Clicks or other artifacts in the mix

Clicks are often caused by bad edits, imprecise mute automation or automation errors. Using headphones, solo each track in the mix until you find the culprit. Random clicks are often caused by using a sound card buffer size that is too low. Use a higher buffer size and try again.

White noise in the exported audio file

Loud white noise is usually caused by a computer error or file transfer error. Restart your computer and sequencer and export again. Always pack WAV files as a ZIP file before transferring over the Internet.

Sending Files Over the Internet

Before sending a file on the Internet you should pack it as a ZIP file to maintain data integrity. You can upload and share your file to getintouch@warmaudiomastering.co.uk by using your prefered online file sharing service such as Dropbox, Google Drive, WeTransfer etc.

On a Mac you ZIP a file by Control+clicking or right-clicking on the file or folder and choosing "Create Archive" from the pop-up menu. In Windows you need a ZIP program such as WinZip. If you are using an online file service please do not use one that requires registration or a waiting period before downloading.

Projects With More Than One Song
If your project contains more than one song then send the first mix to me as soon as it is finished - before continuing with the next mix. In this way I can alert you to general mixing errors before you repeat them in the next mix.

Song Order and Other Notes
Let me know about problems in the mix and your wishes for the end result. However, rest assured, I will notice any problems automatically and enhance the sound in the right places. If your songs are part of an album or an EP then write down the song order in an email or attached document. If you have special wishes for pauses between tracks, segues or bonus tracks then let me know in advance.

ISRC - International Standard Recording Code
If you need ISRC on your master CD or in your MP3, please send the codes to me by email or in an attached document. ISRC can not be embedded into a WAV or AIFF file, only on a physical audio CD or a DDP disc/image - or in an MP3.

💡 ISRC is necessary if your music is to be sold on iTunes. If your music is being played on the radio, ISRC is an advantage for identification purposes. As a record label you can order the first part of the ISRC from your local department of IFPI. The rest of the code consists of the items below, which means that each song has its own unique ISRC for later identification.

US-ABC-09-001-01 (country code-record label-year of registration-release-track)

MP3
It is possible to order a high quality MP3 version of your master. ISRC can be embedded in the ISRC ID3 meta tag. Let me know what bitrates you would like to have your MP3s in.

UPC/EAN
The Universal Product Code (UPC) is the barcode attached to products you buy in a shop in the United States and Canada. The barcode decimal data can be embedded in the CD, too. The European Article Number (EAN) is the European equivalent but it is also being used in other parts of the world.

💡 You can buy a UPC by contacting the Uniform Code Council (also known as GS1-US) in the United States. You can buy an EAN code by contacting EAN International (also known as GS1). They will refer you to your local department.

Evaluating Your Master

Listen to your master in the same places where you normally listen to your music: in your living room, in your studio, in your car, on your iPod or on your computer (do not use the internal speakers of your iMac or laptop for evaluation as they have a built-in multiband limiter on the output).

🔍 Use the same volume level as you normally do. If you like to play loud in the studio, then play your master loud. If you play at low levels in your living room then set the volume low. This will give you the best grounds for comparison. A well rounded mix and master will work at all levels.

Loudness Potential

Each mix has its own loudness potential. The final loudness of a master is not only determined by the mastering process but is a matter of arrangement, production, recording and mix quality.

Various degrees of dynamic processing

🔑 A simple arrangement with few, but well-chosen sounds, has more loudness potential than a big arrangement with a lot going on simultaneously. I can let you know when your song has reached its loudness potential. Pushing the envelope beyond that limit will gradually deteriorate the sound quality, causing audible distortion and squashed dynamics.

The illustration above shows various degrees of dynamic processing. The original mix has lots of dynamics, but lacks dynamic control and loudness.

A dynamic master sounds coherent, pleasant, and has plenty of the original dynamics retained, but it will not compete with most commercial pop music in terms of loudness.

A loud master is a compromise between a great sounding song and competitive loudness. It will sound good while being approximately as loud as most other pop music.

A squashed master will sacrifice sound quality and dynamics in order to sound extremely loud - the side effects being distortion and a complete lack of dynamics.


Important Information About the Sound in iTunes

iTunes can sound identical to your sequencer or any other neutral media player. However, first you need to turn off certain preferences. If not, iTunes can make your master sound lower or different in terms of frequencies.

Go into the menu: iTunes > Preferences > Playback. Make sure Sound Enhancer and Sound Check are not activated. Quit and restart iTunes.
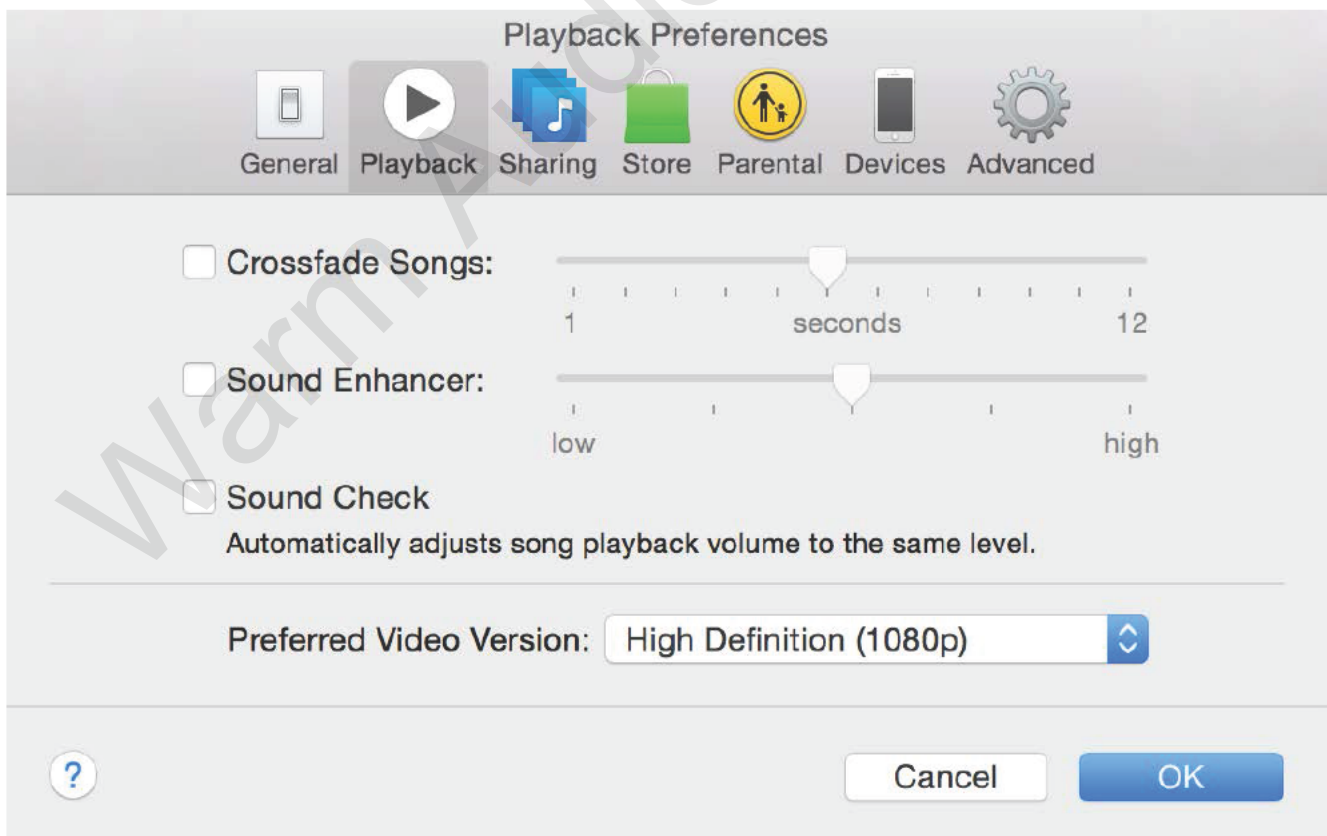
Turn off "Sound Enhancer" and "Sound Check" in iTunes
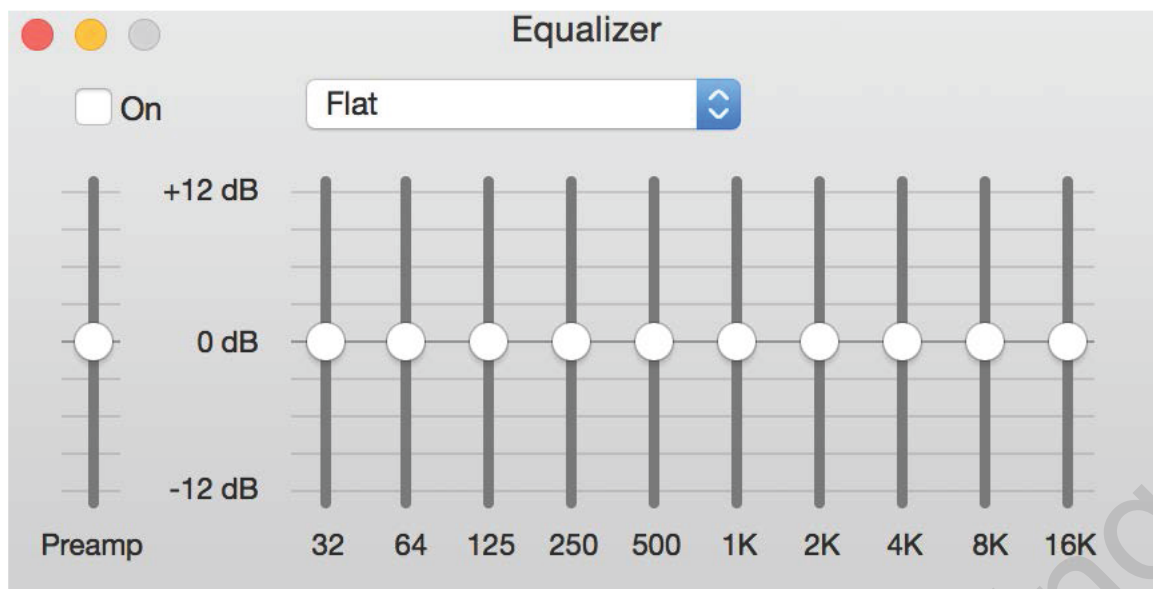
Choose the Windows menu and open the Equalizer. Make sure it is turned off.

More Questions?

Contact getintouch@warmaudiomastering.co.uk.