

MIX RECOMMENDATIONS

Disclaimer: This document is meant as a quick guide and is only intended to reflect mixing recommendations until a more detailed and thorough document is forthcoming from a pro game audio body. It does not represent any official mixing recommendations on behalf of any person or company.

CALIBRATION & SET UP

This step is critical and ensures that the levels of all speakers are correct and that you are listening at a designated reference listening level. This will enable you to make critical decisions about the overall levels of sounds, music and dialogue in the game.

Listening Levels

Calibrate mixing environment to a 79dB or 85dB reference listening level. Recommend 79dB as this is a standard for home entertainment. 85dB is a standard for theatrical listening (cinema theaters)

Use this quick link for recommended calibration files and guidelines...

http://www.cdeenen.com/Charles_Biz/Tips.html

Other

- Account for the +10dB that Dolby Digital adds to the LFE (not sub!) signal when decoded - by 'Printing' any LFE channel info 10dB lower.
- Ensure that cross-over is sending low frequency sounds from the mains to the sub-woofer ('Sub')
- Ensure no unwanted processing or attenuation is occurring via the receiver ('phantom centre' and 'no centre' presets etc)
- If your receiver has dialogue normalization (dial norm) ensure you mix in Dolby Digital as dial norm will add around +4dB to the output levels (it is OK to have a game 4dB too quiet, but not to have a game +4dB too loud)
- Ensure you have calibrated surround metering up to the resolution you are mixing (i.e. RTW surround control / analyzer)
- Some compatibility issues may result from HDMI 1.2 (older implementations of HDMI) cables in the chain

MIXING (Some guideline goals)

Recommend you spend at least one DEDICATED week mixing your target platform and an additional week for any other sku that has a different surround configuration or sound codec. Mixing times vary enormously depending on project, genre and length of game-play. Plan to be able to do at least two entire thorough passes of the game (entire play-throughs)

- Aim for dialogue peak levels of -12dBFS (Microsoft recommendation) "**...the general recommendation is for games to target -12 dBFS for the peak level of dialogue output from the Xbox 360 (if dialogue is present), with long-term A-weighted (Leq(A)) dialogue output levels at -22 to -26 dBFS**" - from 'mixing_for_xbox_360_bp.doc' *Note: The C-Weighting curve is potentially more representative of the listening range we want and much closer to what is measured with Dorrrough or SpectraFoo meters. Typical average dialogue levels we can measure with our tools stand around the -20 to -18 dBFS, which is very similar to -26 to -22 dBFS A-weighted.*
- Aim for internal consistency in levels between cut-scenes, mission delivery and in-game dialogue (in terms of both levels and speaker assignment)
- Overall output levels of the game should be tolerable at whatever reference level you have chosen
- Take regular (hourly) breaks when mixing at reference level
- Do not mix for longer than 8 hours total per day

- Where possible, mix with two or more people, and always get a second or third opinion on the mix
- Where possible, record the output (via pre-outs on receiver) to a surround waveform and compare with other surround waveforms from similar games from the same receiver. This way you can analyze competitors levels and mimic them if required.
- Avoid constant use of LFE for long periods of game-play. It is recommended that the LFE is used for infrequent special 'wow' moments only.
- Avoid 'sending' sound sources to the LFE, this can produce comb filtering effects. Better to have a dedicated Low frequency sound that goes only to the LFE that is played at the same time as the sound effect you wish to add LFE to. (Dolby recommendation)
- Avoid sending sounds such as dialogue to both the Centre, Left and Right at the same time - this creates unpredictable results and volume levels with fold-downs. Recommend choosing CENTRE only or LR only routing.

CHECKING

Perform the main mix of the game at the highest resolution available, e.g. 7.1 or 5.1 and check the other listening configurations later against your master mix for tweaks.

Allow at least one day after final mix to tweak the mix based on various fold-downs and other listening configurations available as below...

- Play a representative section of the game (including cut-scenes, game-play, mission delivery) in the following situations...
- Check mix at a level -10dB below reference level. Ensure that the dialogue is audible and the sounds comprehensible at lower listening levels
- Check Stereo fold-down without crossover (mute 'sub' on RTW surround controller)
- Check mix on television speakers (with and without any compression technology built into the tv)
- Check mix on television speakers and on (calibrated) consumer surround system in a noisy non-studio environment (e.g. meeting room with AC)
- Remember Dolby Digital fold-down does not include LFE (so any pure LFE moments will result in silence)
- Check the following configurations on each console (Tweak mix accordingly and then re-check the master 7.1 mix one final time) ...

PS3 (HDMI)

Check Dolby Digital Stereo fold-down
 Check PCM Stereo fold-down
 Check All PCM Surround configurations

PS3 (OPTICAL)

Check Dolby Digital Stereo fold-down
 Check PCM Stereo fold-down
 Check All PCM Surround configurations

Xbox360 (HDMI)

Check Dolby Digital stereo fold-down
 Check Dolby Digital

Xbox360 (OPTICAL)

Check Dolby Digital stereo fold-down
 Check Dolby Digital

Xbox360 (ANALOG)

Check Stereo fold-down
 Check Dolby Pro Logic II

