Developers Update

Brian Schmidt

Developer Outreach

- GameSoundCon Roundtable on Hearing Health in Video Games

- Presentation on Hearing Health in Video Games at GDC 2024 (March)

GDC 2024 Featured Session

Hearing Health in Video Games

Presented by: Brian Schmidt

This year, the World Health Organization began reaching out to the video game audio community, inviting those involved in the game industry and esports to participate in their June 2023 Make Listening Safe consultation. One of the outcomes of the meeting was recognition of the need to make the game industry more aware of issues around listening safety.

VIEW ALL SESSIONS

GameSoundCon Roundtable

- 20+ attendees from studio of varying sizes (Zynga, Microsoft, Indie developers, Netherrealm (Mortal Kombat), Universities…)
- Hearing Health "Not something we've thought about" (except their own)
- Smaller developers: easier to adopt a standard if the "Big studios" are adopting
- Unsure of software spec for puzzle games (Zynga). May depend on Genre
- Most attendees had a personal experience
  - Friend/family member with hearing loss

Console/Software Reach-out

- Recommend emphasis be placed on hardware/devices
  - "far fewer gaming headset makers than game developer"
- Challenges of not knowing SPL level at player's ears
- Too intrusive or too many "false positive" and players will disable

Some challenges raised by Developers/Platforms

- Audio mix may be a gameplay element
  - Skill/practice in listning required to become better player
- Warnings/popups during gameplay are intrusive
  - Best to piggyback on existing 'toast' mechanism
- Console mandates (TRC) are used extremely sparingly
  - Difficult to create rules that apply to all titles
- Microsoft has ability to highlight accessibility features for more visibility in the online store
  - "Carrot" approach

Some challenges raised by Developer/Platform

- "Automatic" volume leveling can be annoying for players
  - Even if just compression, if too heavy-handed
- Need to be considerate of hard of hearing players, who may need to listen at high SPL; do not want them to feel excluded
- Recommend handling esports in a separate document. "Seems out of place" in this document
- Concerned consoles may be 'penalized' if PC's have lighter specifications

Headphones

- Creating audio for headphone listening challenging even without regard to hearing safety

- "They are wild in how much they vary" in volume and EQ

- A sound that is perfectly acceptable in most, "can be horrific in one set"

Audio

CS2 is best enjoyed with stereo headphones. CS
and modeling based on individual sound source
any external audio enhancements or virtual su

Master Volume

Audio Device

Audio Output Configuration

EQ Profile

L/R Isolation

Perspective Correction

Advanced 3D Audio Processing

Enable Voice

Voice Input Audio Device

VOIP Volume

Streamlined Push To Talk

VOIP Positional

Changes overall sound coloration in CS2. Can help offset sound coloration caused by various hardware and software combinations. Give yourself time to acclimate to a new EQ profile.

Natural (default): No additional coloration.

Crisp: Enhances mid and high frequency bands. Can help with sound localization and reduce muffling. May sound harsh in certain situations.

Smooth: Reduces mid to high frequencies. Can help reduce harshness, volume spikes, and ear fatigue during long play sessions. Ideal for studio grade headphones and players that listen at louder volumes.

Ideal for studio grade headphones and players that listen at louder volumes.

PC Comments

- Realtek and Microsoft HD Audio Driver might cover 70%

- Challenge of pre-installed audio enhancement software

- Steam (Valve) and Unreal Store are the closest analogies to console-like control over content

- Very challenging ecosystem

Other Devices

- Meta Quest
- Steamdeck
- Valve Index (VR Headset)
- Apple Vision Pro (AR Headset)
- (Xbox, Playstation, Nintendo)

A New Topic!

- This hasn't been something we as an industry have given much thought to…

- *…but close to some things we have worked on***

*** Game Audio Authoring recommendations/standards are not well enforced or fully adopted*

Loudness Standards

Accessibility

Listening Environment Settings

Audio Customizability

[GANG IESD MIX RECOMMENDATIONS]
[Document v.03.02]
[2015.03.11]

IESD Recommended Loudness

Sony, Microsoft & Nintendo Console Titles

The IESD, through thorough discussion, have reached consensus between its various members and associated partners to recommend the following overall loudness numbers.

Measurement of Loudness Level and True Peak Levels should be done according to the ITU-R BS.1770-3 algorithms and specifications via a compliant meter*.

> Recommended Average Loudness for a console title should be normalized to -24 LUFS (tolerance of + or – 2 LU)
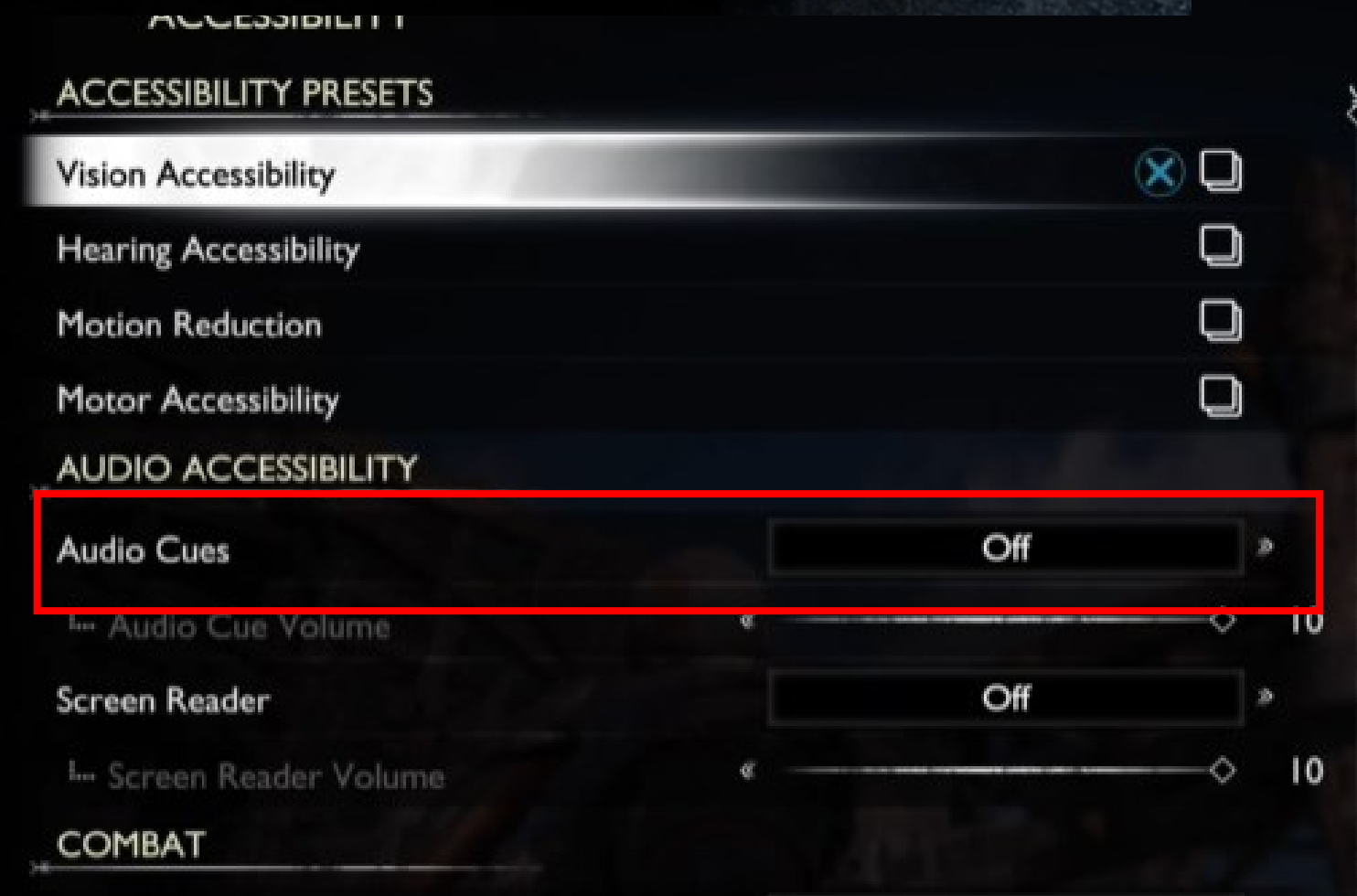
Example: Player option: Different output Mixes for Different Listening Environments

Here are my measurements from Knights and Bikes:

- **Large Speakers** = -22.3 LUFS, 20.0 LU range, -6.2 dBTP
- **Small Speakers (Default)** = -22.7 LUFS, 15.8 LU range, -8.5 dBTP
- **Night Mode** = -22.5 LUFS, 14.1 LU range, -9.3 dBTP

God of War Ragnarök accessibility options

Explore over 70 accessibility features in God of War Ragnarök that enable players to customize the gameplay experience to suit their needs.

ACCESSIBILITY

ACCESSIBILITY PRESETS

Vision Accessibility

Hearing Accessibility

Motion Reduction

Motor Accessibility

AUDIO ACCESSIBILITY

Audio Cues   Off

⌐ Audio Cue Volume   10

Screen Reader   Off

⌐ Screen Reader Volume   10

COMBAT

VISION ACCESSIBILITY

A suite of options optimized for low vision gaming. Large Text and High Contrast Display boost visibility to make characters and objects stand out from backgrounds. Navigation and Traversal Assist enable more fluid guidance to selected tasks. Optimized Combat Camera and Lock-On keep attacks on target. Audio Cues and Auto Pickup make sure you don't miss any loot. Puzzle assists will smooth targeting and timing.

Possibility of Implementation

- Technical Feasibility
  - Is it possible?
- Practical Feasibility
  - Can it be achieved with reasonable effort

Possibility of **Device Implementation**

- Consoles: tight control over entire audio system
  - Dosimetry (to extent possible)
  - Volume limiting options
  - Parental Control Volume
  - Status/Dosage Meters
  - WHO-ITU-870-like specification, modified for gaming likely possible
- PC's
  - Much more challenging due to open architecture (Soundcards, Different PC makers, looser standards)

Possibility of Software/Content Implementation

- Initial Informal Discussions Promising
  - Microsoft Game Studios
  - PlayStation Design and Audio Team
- "Cautiously optimistic"
- Education & Evangelization

Summary: We *want* to be safe, but…

- Immersion is our goal
- Ideally find ways to be both safe and fully immersive
- Device Standards may be easier to implement/enforce than SW Recommendations/Standards
- Open platforms (like PCs) will be a very large challenge

Summary: We *want* to be safe, but…

- Immersion is our goal

> 11:03 AM
>
> Most games are louder than the Sony standard, some shockingly so. VR at -18 is what I mix to, particularly for the bad earbuds to allow things to sit in the sweet spot of terrible speakers. Worst case the user plugs in earbuds and has to turn down master volume a touch. Tom Bible on Henry, mixed at Skysound, ended up at -18 LKFS for CV1 Oculus and found the typical levels too quiet.

Open platforms (like PCs) will be a very large challenge