

HRA-TC Meeting Notes, 150th Convention, June 3, 2021

Virtually present:

Wieslaw Woszczyk

Steve Hutt

Bob Stuart

Jamie Angus

Hyunkook Lee

Sergio Liberman

Hans van Maanen

David Rich

Vicki Melchior

1. Events from the 150th, completed last week:

Two events sponsored by HRA are available until July 2 for on-demand viewing (if registered).

- a) Jamie Angus's tutorial on bit depths and noise-shaping in DACs: "Modern Digital to Analog Converters, HOW Many Bits?"
- b) Workshop: "Streaming as the Future of High Resolution Audio Distribution".

2. Short discussion of new prospects in high res streaming:

Continuing from the workshop topic (Vicki). There has been increasing interest from consumers in better streaming quality than the lossy codecs used ubiquitously by the major streaming services. The major record labels recognized this and from 2017 onward have released many titles in higher resolutions. The main bottleneck to broader distribution has been lack of uptake by the large streaming services (although Tidal, Amazon, and Deezer all offer CD or better quality). This has changed in the last few weeks, with Apple announcing streaming of lossless CD, high res to 192/24, and Atmos. Spotify will introduce CD within the year but no mention of high res. All services are looking at live streaming and Atmos. The result will be a competitive price war in the next year(s) but if some of the impediments can be overcome, including better hardware quality, interface paths, and integrated software like Exclusive Mode, there is a potential for better audio quality.

3. Event proposals for the fall convention (151st)

Two tutorials were proposed earlier for the 151st and both are under consideration:

- a) Bob Stuart – on the topic of design of active digital loudspeakers
- b) Bob Katz, Jamie Angus, and Bruno Putzeys – on the topic of current drive vs voltage drive in loudspeaker-amp combinations

Also, Jamie proposed a new tutorial walking through the arithmetic operational details of floating point implementation, including demonstrating how up and down scaling and re-normalization are done for functions like addition and multiplication. There is a problem with floating point, especially 32b, in that conversions from 32b float to 24b integer and back should be exact under the IEEE 754 standard, but not all processors conform to the standard, so some computers will not produce reversible values. This dependency on CPU was noted by Bob Stuart in work with Peter Craven, so Jamie and Bob will consider joint effort on this proposal.

4. Steve Hutt noted that Tech Council will initiate a series of online webinars that can be archived, and suggested those as alternatives to conventions for tutorial presentation.

5. Short recap by Hyunkook of his presentation on "Discrimination between Audio Stimuli: How to Design an ABX Test".

The talk was given earlier to the South German AES section, and is available on youtube:

<https://youtu.be/Hb544K7PnQo>

The standard ABX protocol used in audio testing (e.g. ITU-R-B.1116) is an evolved outgrowth of the original psychophysical ABX test from the 1950s. While the current versions allow the listener unlimited switching (pairwise) between A, B, and X during a trial, the original version, which is based in signal detection theory (SDT) and widely used in psychoacoustic testing, involves a single presentation of A,B, and X per trial, in a controlled time sequence with no switching. Hyunkook reviewed pros and cons, saying that the advantages of the SDT-based method are the ability to measure listener sensitivity (d'), bias, and short test duration, but that it has the potential, awaiting testing, for greater accuracy compared to standard ABX as well as less perceptual fatigue.