

## **BCC-Sponsored Program on Technical Metadata for Music Stresses Importance of Embedded Metadata**

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The chair of the BCC Metadata Subcommittee, Jenn Riley, introduced the program on Technical Metadata for Music, held on Thursday, February 10, from 1:30-3:00 p.m. In the first presentation, **Technical Metadata for Audio Preservation: a Brief Introduction**, Kimmy Szeto (SUNY Maritime College) described how technical metadata and specifications enable successful playback, track technical processing history, and ensure authenticity and integrity of digital audio files. This metadata can be created automatically and works well when embedded. Embedded metadata is metadata stored within the file itself, often within the filename. Two factors to take into account are whether it is readable by humans and whether it is sustainable. Szeto referred to the Library of Congress' requirements for a sustainable audio file format: disclosure, adoption, transparency, self-documentation, external dependencies, impact of patents, and technical protection mechanisms. (LC's Sustainability of Digital Formats site may be accessed at: <http://www.digitalpreservation.gov/formats/sustain/sustain.shtml>). He went on to discuss how the Broadcast Wave Format (BWF) adheres to these requirements. Specifications for the BWF are disclosed in the European Broadcast Union document, EBU Tech 3285. (<http://tech.ebu.ch/docs/tech/tech3285.pdf>). This format has been adopted by such organizations as the Audio Engineering Society (AES), National Academy of Recording Arts and Sciences (NARAS) and Sound Directions. The BWF allows embedded metadata, which fulfills the self-documentation factor, and there are no hardware, software, patent or licensing requirements for it.

Getting to more technical aspects, Szeto explained that the BWF is an extension of Microsoft's WAVE format, and that both BWF and WAV formats contain metadata embedded as XML in "chunks." Certain metadata are mandatory for some WAV chunks. For example, in the WAV Format Chunk the encoding format, number of bits per sample (bit depth), average number of samples per second (sample rate), data length/duration of file, and number of mono or stereo channels are necessary, whereas metadata about the location of the archival and copyright information may be incorporated into optional chunks. In BTF, on the other hand, only one chunk is mandatory, and the others optional. The mandatory chunk includes Description, Originator, Originator reference number (which can include checksum), Origination Date, and BWF version. (The Supplement 5 to the EBU document cited earlier gives specifications for BWV chunks: <http://tech.ebu.ch/docs/tech/tech3285s5.pdf>). Having additional metadata in optional chunks allows for greater flexibility.

The second speaker was Chris Lacinak of AudioVisual Preservation Solutions, a company which has helped preserve music for the Rock and Roll Hall of Fame, who talked about **Embedded Metadata (in WAVE files)**. Lacinak asked the question, "Why embed?" Besides the fact that everyone else is doing it, embedding metadata within the file itself is essential for audio archives in maintaining authenticity and integrity of the files, in identifying, describing, and managing them, and in avoiding unnecessary redundancies. It is also important to end users, creators, rights holders and legal entities. Embedded metadata can give users more information about a document, picture, or recording. Embedding also

helps prevent problems in data recovery and in inadvertent changes across operating systems. As Lacinak put it in one of his slides, “to ignore it is to effectively de-catalog.” He describes situations wherein an archivist or librarian receives a hard drive with thousands of files on it, but no clue as to what those files are, or who created them. He even cited a legal case, in which a judge for the state of Arizona argued that metadata embedded in public records in electronic format was subject to disclosure under public records laws. In short, embedded metadata increases interoperability, or the ability to move audio data like text.

He then moved from the “why’s?” of embedding to “what?”—specifically, to creating metadata for WAVE files. Expanding on Szeto’s earlier comments, he described file structure in terms of format chunks and data chunks. Lacinak discussed the **ARSC TC Metadata Study**, which he conducted with Walter Forsberg, Tom Endres, Tommy Sjöberg, and Preston McCabe. They tested and compared seven end-user audio applications used for recording, editing and playback for interoperability related to embedded metadata and for persistence and integrity within and across applications. They found that some applications append extra metadata to certain chunks. The investigators also analyzed persistence and integrity in derivative creation in WAVE, MP3, and FLAC. They discovered that there was no consistent display and management across or even within systems, and recommended that concerned people should advocate for change.

Lacinak ended his presentation with an overview of BWF MetaEdit, an open source tool developed by AudioVisual Preservation Solutions and freely available from the Federal Agencies Digitization Guidelines Initiative (FADGI), that enables one to create and standardize embedded metadata . It is CSV or XML based, and may be downloaded from:

<http://sourceforge.net/projects/bwfmetaedit/>

The slides to Lacinak’s presentation may be accessed at:

[http://www.avpreserve.com/wp-content/uploads/2010/11/embedded\\_metadata\\_lacinak.pdf](http://www.avpreserve.com/wp-content/uploads/2010/11/embedded_metadata_lacinak.pdf)