AES31-2-2012
Revision of AES31-2-2006

AES standard on network and file transfer of audio – Audio-file transfer and exchange – File format for transferring digital audio data between systems of different type and manufacture

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Abstract

The Broadcast Wave Format is a file format for audio data. It can be used for the seamless exchange of audio material between (i) different broadcast environments and (ii) equipment based on different computer platforms.

As well as the audio data, a BWF file (BWFF) contains the minimum information - or metadata - that is considered necessary for all broadcast applications. The Broadcast Wave Format is based on the Microsoft WAVE audio file format. This specification adds a “Broadcast Audio Extension” chunk to the basic WAVE format.

An optional Extended Broadcast Wave Format (BWF-E) file format is designed to be a compatible extension of the Broadcast Wave Format (BWF) for audio file sizes larger than a conventional Wave file. It extends the maximum size capabilities of the RIFF/WAVE format by increasing its address space to 64 bits where necessary. BWF-E is also designed to be mutually compatible with the EBU T3306 "RF64" extended format.

This revision additionally packages a set of machine-readable loudness metadata into the BWF file. This is compatible with EBU v2 broadcast wave files.

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Foreword

[This foreword is not part of the AES31-2 *Standard on network and file transfer of audio – Audio-file transfer and exchange – File format for transferring digital audio data between systems of different type and manufacture*.]

This document was produced by a writing group of the SC-02-08 Working Group on Audio-File Transfer and Exchange of the SC-02 Subcommittee on Digital Audio under project AES-X066. Contributors to this project included: D. Ackerman, S. Aoki, I. Beynon, D. Brenan, J. Bull, R. Chalmers, B. Devlin, J. Emmett, A. Faust, C. Garza, Y. Grabit, U. Henry, A. Holzinger, P. Jessop, H. Nakashima, M. Yonge, J. Yoshio.

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SC-02-08 Working Group on Audio-File Transfer and Exchange
2006-03-25

Foreword to 2012 edition

This revision incorporates AES31-2 Am.1 2008, *Amendment 1 to AES31-2 - Audio-file transfer and exchange - Part 2: File format for transferring digital audio data between systems of different type and manufacture - Extended file format for audio to exceed 4 GByte* as annex G.

This revision also introduces a means to carry loudness metadata related to the audio content. These files are identified as version 2 and are both forwards and backwards compatible with version 1 files and implementations.

M. Yonge, chair SC-02-08 Working Group on Audio-File Transfer and Exchange
2012-11-19

Note on normative language

In AES standards documents, sentences containing the word “shall” are requirements for compliance with the document. Sentences containing the verb “should” are strong suggestions (recommendations). Sentences giving permission use the verb “may”. Sentences expressing a possibility use the verb “can”.

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0 Introduction

0.1 General

The broadcast-wave-format file (BWFF) is based on the Microsoft Wave audio file format, which is a type of file specified in the Microsoft resource interchange file format (RIFF). Wave files specifically contain audio data. The basic building block of a RIFF file is a chunk which contains specific information, an identification field, and a size field. A RIFF file contains a number of chunks.

The BWFF specifically includes a <Broadcast Audio Extension> chunk to carry certain metadata important for broadcast and professional use. For reliable interchange, some restrictions apply to the format of the audio data.

This document contains the specification of the broadcast audio extension chunk and its use with PCM-coded audio data. Basic information on the RIFF format and how it can be extended to other types of audio data is given in annex A and annex G. Details of the PCM Wave format are also given in annex A.

0.2 Data types

The following mnemonics describe the data types used throughout this document. Multi-byte data types are little-endian:

Data Type	Meaning	Equiv. C type
CHAR	8-bit signed integer, representing integer values from –128 to +127	signed char
BYTE	8 bit unsigned integer, representing integer values from 0 to 255	unsigned char
INT	16-bit signed integer, representing integer values from –32768 to +32767	signed short int
WORD	16-bit unsigned integer, representing integer values from 0 to +65535	unsigned short int
LONG	32-bit signed integer, representing integer values from –2,147,483,648 to +2,147,483,647	signed long int
DWORD	32-bit unsigned integer, representing integer values from 0 to +4,294,967,295	unsigned long int

1 Scope

This standard defines a file format for interchanging audio data between compliant equipment. It is primarily intended for audio applications in professional recording, production, post production, and archiving.

It is derived from the EBU Broadcast Wave Format but is also compatible with variant specifications including ITU-R BR.1352-2-2002 and the Japan Post Production Association's BWF-J.

An optional extended format, BWF-E, supports 64-bit addressing to permit file sizes greater than 4 GBytes.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this document. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this document are encouraged to investigate the possibility of applying the most recent editions of the indicated standards.

SMPTE 330M-2000; *SMPTE standard for television - Unique Material Identifier (UMID)*, Society of Motion Picture and Television Engineers, White Plains, NY., US.

ISO/IEC 646:1991; *Information technology - ISO-7-bit coded character set for information exchange*. International standards Organisation, Geneva, Switzerland

ISO 8601; *Data elements and interchange formats - Information interchange - Representation of dates and times* International standards Organisation, Geneva, Switzerland

3 Definitions and abbreviations

3.1
RIFF
resource interchange file format, a file representation upon which the Wave file format is based

3.2
chunk
data package within RIFF files containing related data

3.3
ASCII
7-bit character code compliant with ISO/IEC 646

3.4
Wave
Audio file format based on the RIFF file structure

3.5
EBU
European Broadcasting Union

3.6
Broadcast Wave Format File
BWFF
Wave file containing the **bext** chunk as described in this standard

3.7
bext
broadcast extension chunk