



IABM Report on AES Standards Committee Meetings

12 - 16 and 30 May 2025

This report is a confidential IABM member resource.

AES Standards meetings are held twice a year to progress the development of new Audio Engineering Society standards and to revise existing ones.



The AES is currently holding its Standards meetings online. Until recently, the meetings were always held face-to-face as part of the AES Conventions that are held twice per year. This time, the associated AES Convention will be 22 - 24 May in Warsaw.

An IABM representative attends the AES standards meetings and we produce the following information after each meeting round:

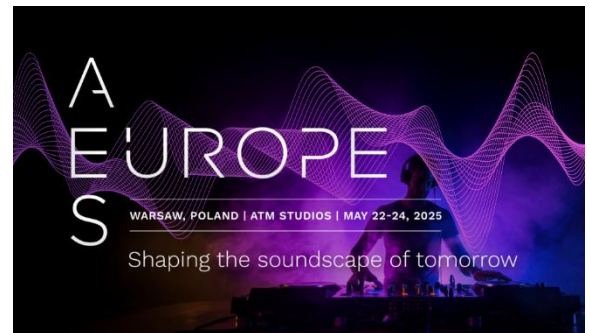
- Executive Summary in [Technology News](#) items
- This report, focussing on a selection of projects thought to be of interest to members
- An update to the Standards Monitoring Group (SMG) projects (usually a few weeks after the meetings, to give people a chance to do the work they've signed up for). [More information](#) about the IABM SMG service that helps members to be more involved with development of relevant standards.

Between the six-monthly meetings, we attend telecons for relevant standards projects and issue technology news items [on this page](#) (login required).

We also update the SMG project information.

	LA	7:30	8:00	8:30	9:00	9:30
	NY	10:30	11:00	11:30	12:00	12:30
	London	15:30	16:00	16:30	17:00	17:30
	Warsaw	16:30	17:00	17:30	18:00	18:30
	Tokyo	23:30	0:00	0:30	1:00	1:30
Fri. 5/9 2025			(C) AESSC Steering			
Mon. 5/12 2025			SC-05-05		SC-04-03	
Tues. 5/13 2025			SC-04-08		SC-03-12	
Wed. 5/14 2025			SC-04-09	SC-02-08	SC-02-01	
Thur. 5/15 2025			SC-03-06		SC-02-02	
Fri. 5/16 2025			SC-02-12	SC-03-07	SC-05-02	
Fri. 5/30 2025			AESSC PLENARY			

Held online - but associated with the 158th AES Convention in Warsaw - [program details here](#).



We normally attend the Standards Committee plenary and the Working Group meetings for:

- Digital Input/Output Interfacing (SC-02-02)
- Audio-File Transfer and Exchange (SC-02-08)
- Audio Applications of Networks (SC-02-12)
- Digital Audio Measurement Techniques (SC-02-01)
- Digital Library & Archive Systems (SC-03-06)
- Metadata for Audio (SC-03-07)
- Audio Connectors (SC-05-02)
- Grounding and EMC Practices (SC-05-05)

The other Working Groups are Forensic Audio (SC-03-12), Loudspeaker Modeling and Measurement (SC-04-03), Microphone Measurement and Characterization (SC-04-04), Measurement of sound systems in rooms (SC-04-08), Loudness and Annoyance (SC-04-09).

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The Chair of AES Standards Committee is Bruce Olson, Vice Chair Jeff Berryman, Secretary Rich Cabot.

The IABM welcomes feedback on these resources to help us fine-tune the projects we study and report on.

There are lists of recently-initiated projects as well as AES Engineering documents published in the last quarter at the [end of this report](#).

General Information picked up at the meetings:

Links in each page header allow fast navigation to each of these topic groups as well as the SMG projects that are covered in greater detail.

If this is the first time you have used one of these reports, there is a [page](#) at the end of the report that explains the AES Standards process, Technology Committees - and the acronyms used!

HUGE DISRUPTION TO AES STANDARDS RESOURCES

For several months now, various features of the standards resources have been shut down in preparation for moving to a new system. These include the standards development document repository, project tracking, agenda and meeting report archive, email lists and others. The published standards site is also out-of-date, and the Standards Manager cannot post the latest revisions. Some project Chairs have created their own Google Drive repositories in order to keep going, but much work has stalled.

As a result, many of the projects have not made progress, and that is reflected in this report. Please [contact me](#) if there are any specific projects you need more updating on, and I'll contact the Chair personally.

Any Good News? Well, replacements for all the services that have stopped working are starting to appear. Over a period of a couple of months, they will be rolled out. I should regain access to documents and users will get access to publications that have been in the queue for a few months. So Normal Service may be resumed by the Fall round.

This “general” information is usually gathered during the AES Standards plenary meeting. However, that meeting is being held very much later - May 30. If anything important emerges, it will be posted as a Technology News item on the IABM website.

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Projects Covered In-depth by our Standards Monitoring Group (SMG)

Member Alert: These projects are currently being monitored within the IABM's Standards Monitoring Group (SMG). See [more information](#) about this IABM service that allows members to be more involved with development of relevant standards.

These projects have been selected because they are topics of importance to our industry and deserve additional attention. As well as attending the six-monthly face-to-face meeting rounds, the IABM attends the document development telecons for these projects.

Streaming Audio Metadata over IP

AES-X242 Streaming audio metadata over IP networks - assigned to task group SC-02-12-R

The group has compiled a list of potential applications for this technology to guide and validate the design.

Some members of this group have participated in the SMPTE group developing ST 2110-41 and that SMPTE group was made aware of the AES-X242 requirements.

Status at meeting:

ST 2110-41 is now published (though a small error is being corrected). The X242 project leader apologized for the lack of progress recently and announced that he will hold a meeting shortly to check whether there is still interest in the project and hopefully get the project moving again.

AES-X242

Scope: define a standardized method for transporting metadata associated with audio in an AES67 stream. The audio metadata shall be transported in a separate stream that is sent in parallel to AES67. The standard shall define synchronization between the audio metadata transport and the associated AES67 transport.

The document originally used a metadata wrapping scheme based on SMPTE ST 2109 (defines a data format for audio metadata as well as packaging in AES3).

However, the group saw advantage with harmonizing this work for streaming audio metadata over RTP with a generic RTP media metadata transport being developed in SMPTE, ST 2110-41, Fast Metadata (FMX). As a result, this group's draft standard has been rewritten in line with ST 2110-41 and its Word-ID-Blob format.

The AES-X242 excerpt (right) gives an example of session description protocol for unicast; there is a similar example for multicast.

8.4.2 Unicast session description example

Example simple SDP description for audio metadata transmitted as a unicast stream:

```
v=0
o=- 1311738121 1311738121 IN IP4 192.168.1.1
s=Unnamed
c=IN IP4 192.168.1.1
t=0 0
m=application 5004 RTP/AVP 96
a=rtpmap:96 ST2110-41/48000
a=fmtp:117 SSN=ST2110-41:20xx; DIT=100,2000A1,1013FC,3FFF00
a=ts-refclk:ptp=IEEE1588-2008:39-A7-94-FF-FE-07-CB-D0:0
a=mediaclk:direct=2216659908
```



AES70 - Open Control Architecture projects (Task Group SC-02-12-L)

AES70: Open Control Architecture

Perspective: During the development of these AES standards, the original proponent (Open Control Alliance) continued to develop the system and to resolve some issues that had arisen.

A major change is the replacement of connection management scheme CM3 in the previously published AES70 with the more efficient CM4. There are mechanisms to deal with backwards compatibility. The 2024 document suite is much more robust, easier to use, and it has new features of interest to both the broadcast and pro-audio industries.

This technology was brought to the AES by the [OCA Alliance](#) for standardization at the October 2012 meeting. This suite of documents was first published January 2016, and a set of revised documents was published early in 2019 (dated 2018). The current versions of the suite were published May 2024.

AES70 defines a scalable control-protocol architecture for the control and monitoring of professional media networks.

Part 1: Framework describes the models and mechanisms of the AES70 Open Control Architecture. These models and mechanisms together form the AES70 Framework.

Part 2: Class Structure specifies the AES70 control class structure that defines the control and monitoring functional capabilities of the standard and includes class relationships in machine-readable XML Interchange format (xmi 2.0). Includes UML.

Part 3: OCP.1 Binary Protocol - expanded from its earlier scope and title confining it to IP networks (it was Protocol for IP Networks and specified protocol implementation for TCP, UDP, WebSockets).

Status of AES70 document suite at meeting:

In addition to the established 3 “core” parts of AES70, there are projects introducing further functionality, described below.

AES-X243: Using AES70 connection management for AES67 and SMPTE ST 2110-30

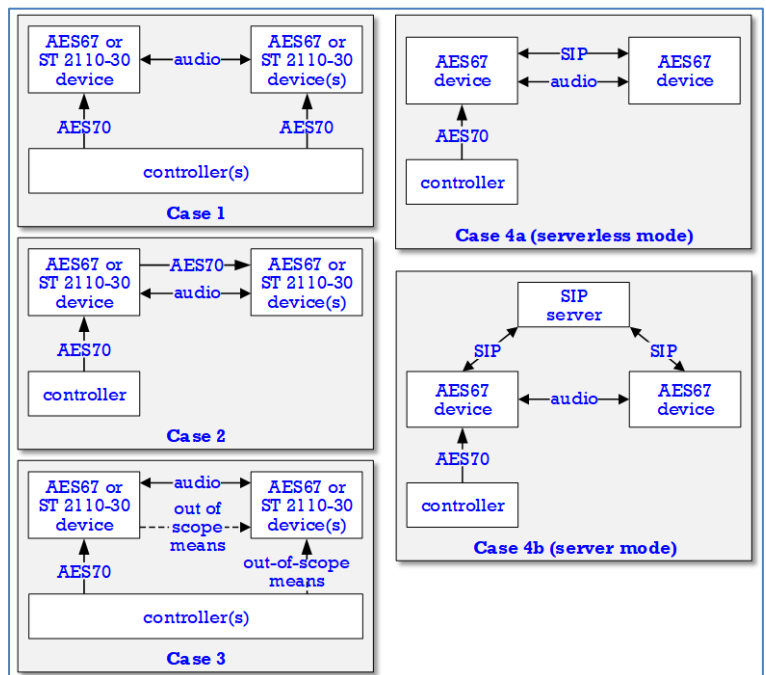
Define a new standard in the AES70 family for using the AES70-CM4 connection management mechanism to set up, manage, and tear down AES67 and SMPTE ST 2110-30 media stream connections. It is document AES70-21.

The use-cases covered are shown in the diagram (right).

Status at meeting:

The document closed public Call-for-Comment, just after the last meeting. Some comments were received from one commenter and the Task Group addressed them and drafted a response to the commenter. However, whilst addressing the comments, the group realized that there was more material needed in the document and a period of revision was undertaken by the Task Group.

That work has just completed and the document has been submitted for a second Call-for-Comment period (it is not clear how that will be handled with the current website problems).



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AES-X252: AES70 Milan Adaptation

The document will specify a common way to control routing of AVDECC/Milan audio streams using an adaptation of the AES70 connection management feature set. The document will also define a programmatic interface between AES70 and AVDECC software drivers that is suitable for implementing the defined adaptation. [Milan](#) is an AVB profile for real-time audio transport, and is created and maintained by the Avnu Alliance.

Perspective: I don't think Milan installations will be seen in Broadcast installations, but it is featured here as it is a member of the AES70 family.

Status at meeting:

The document also closed public Call-for-Comment 6th October 2024. There were no comments and the document was published November 2024 as AES70-22 (though the store doesn't currently have it). It will be moved to this group's maintenance annex, next review due 2029.

AES-X258: Using AES70 to manage Audinate Dante® media transport

Project scope: This standard specifies the use of AES70 to manage Audinate Dante® media stream connections between devices, where AES70 is used to control at least one of the devices, while other devices may be controlled using Audinate mechanisms or other out-of-scope means. The document will be AES70-23.

Status at meeting:

Work began some while ago, but the group soon realized it didn't really have good way of writing as interfaces were not well-enough developed. Now, the group is getting great support from Audinate but the work is inactive as the group has started working on AES70-4, see below.

Project for AES70-4: OCP.2 - JSON Protocol

It was realized at this meeting that a project had not been initiated for this document; that will be corrected shortly.

The AES70 group has just started work on this draft document that has been submitted by the OCA.

This is the scope statement for AES70-4:

This Standard contains the technical specification of the OCP.2 protocol of AES70, the Open Control Architecture. OCP.2 is a JSON-encoded protocol that supports AES70-compliant remote control and monitoring of media devices over IP networks and Point-to-Point Links.

The companion AES70-3 Standard defines OCP.1, a binary AES70 protocol. OCP.1 and OCP.2 are functionally equivalent.

Group	Clauses
Introductory topics	0 ... 5
OCP.2 protocol and related mechanisms	6 ... 8
OCP.2 programming constructs	9
OCP.2 implementation details for various Control Session Transport Types	10 ... 11
JSON Schema - normative specification	Annex A
Protocol data unit examples - informative	Annex B
WebSocket security - informative	Annex C

The table (right) shows the planned functions and structure of the document.



Analog Interfaces

AES-X152 - Standard for PRESENTING signal levels and circuit impedances of audio system components and for the specification of these quantities in product data sheets

The heart of the document was conceived as a datasheet template for each type of interconnect; intended for manufacturers to complete along with their product literature (see a version below for a balanced analog interface; output and input characteristics).

*X152 scope: to develop a standard for signal levels and circuit impedances of audio system components and for the specification of these quantities in **product data sheets** in order to achieve predictable interconnection results (both balanced and unbalanced).*

This project was reactivated in spring 2020 - details [here](#).

Status at meeting:

A great deal of effort has gone into this work, but it has been difficult to get agreement on a number of parameters. At the last meeting, the plan was to make this into a report. I was not clear about why this would make it easier to reach agreement, but nothing has been done in the past 6 months, **so the effort appears to be stalled**. There was also an idea to split the report into 3 or 4 parts.



Other Projects - Arranged by Working Group

Working Group SC-02-01: Digital Audio Measurements

Chair: Jayant Datta; Vice Chair Ian Dennis

- *Measurement methods for equipment used for the recording, reproduction, and transmission of digital audio signals.*
- *Effects of perceptually based coding algorithms on audio signals.*
- *Psychophysical and electrical analysis under all operational and listening conditions.*
- *Ranking of codecs and test methods to determine presence of coders or their proper operation.*

AES17-R Review of AES17-2020: AES standard method for digital audio equipment - Measurement of digital audio equipment

Status at this meeting:

There has been no progress on this since the last meeting. However, some members of the AHG (see below) got together after this meeting to run through the comments and try to agree revised wording in AES17 to resolve the comments.

History: The AHG working on AES-X217 (below) discovered some areas where AES17 could be improved and a small AHG has been formed (6 people) to work on the (growing number of) issues that have been discovered - for instance, specification of the bandpass filter to be used for crosstalk measurements. Three of the Task Group members have submitted quite a few comments - not constrained to the BP filter issue that started this AHG.

AES17 scope: To provide methods for specifying and verifying the performance of digital audio equipment, and specifically to describe the testing of medium- and high-performance digital audio equipment. AES17 has long been a reference document for test procedures in digital audio systems.

AES-12id-R Review of AES-12id-2020: AES information document for digital audio measurements - Jitter performance specifications

Status at this meeting:

The document was reaffirmed and will move to the SC-02-01 maintenance annex.

AES-X217 Audio ADC test method and performance specification for archiving and preservation applications

A draft document has been available for some while.

The group received a large number of comments on this document and these have been incorporated in the latest draft that was submitted to the working group.

Status at this meeting:

It was announced at the meeting that the draft passed public Call-for-Comment. It will be published as an information document when the website permits.

Audio ADC test method and performance specification
At the 2013-05 meeting, a group member who had been working with the US government on requirements for ADCs for archival purposes submitted a document that is based largely on AES17 measurement methods, but which also defines performance limits that must be achieved. It was agreed that this is a very important subject and this project, to turn the input document into an AES standard, was initiated.
It was agreed to separate the measurement definition and the performance required into separate sections of the document to facilitate easy changes to performance specification (e.g. adding requirements for other applications).
A revised draft document was submitted to the Oct. 2016 meeting, reflecting ADC testing experience gained by the author and two colleagues. Wherever possible, the document was based on tests within AES17.

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The “meat” of the document is summarized in the contents extract (right).

There is still some work to be done on the Annex B table, but the document will be completed and put into the standard format of an AES Information Document.

Other SC-02-01 business

The Standards Manager notified the group about work in SC-04-3, principally intended for acoustics measurements that are often “spiky”. It implements a smoothing algorithm.

The group is also responsible for maintaining published documents:

- AES-R7 Standards project report - Considerations for accurate peak metering of digital audio signals

4 Setup
4.1 Signal generator.....
4.2 ADC setup.....
4.3 Filters.....
4.4 Setup diagram.....
5 Measurements
5.1 Frequency response
5.2 Total harmonic distortion + noise (THD+N)
5.3 Dynamic range (signal to noise ratio)
5.4 Crosstalk.....
5.5 Common-mode rejection ratio (CMRR)
5.6 Modulation distortion.....
5.7 Difference-frequency distortion.....
5.8 Gain non-linearity.....
5.9 Spurious inharmonic signals.....
5.10 Alias rejection.....
5.11 Sync input jitter susceptibility.....
5.12 Jitter transfer gain.....
Annex A (informative): Informative references
Annex B (normative): Minimum performance specifications
B.1 Frequency response.....
B.2 Total harmonic distortion + Noise (THD+N)
B.3 Dynamic range (Signal to noise ratio)
B.4 Crosstalk.....
B.5 Common-mode rejection ratio (CMRR).....
B.6 Modulation distortion.....
B.7 Difference-frequency distortion.....
B.8 Gain non-linearity.....
B.9 Spurious inharmonic signals.....
B.10 Alias rejection.....
B.11 Sync input jitter susceptibility.....
B.12 Jitter transfer gain.....

Working Group SC-02-02: Digital Input-Output Interfaces Chair: John Grant

- Specification of configurations, synchronization and operating limits for digital interfaces carrying audio, labeling, and control data.

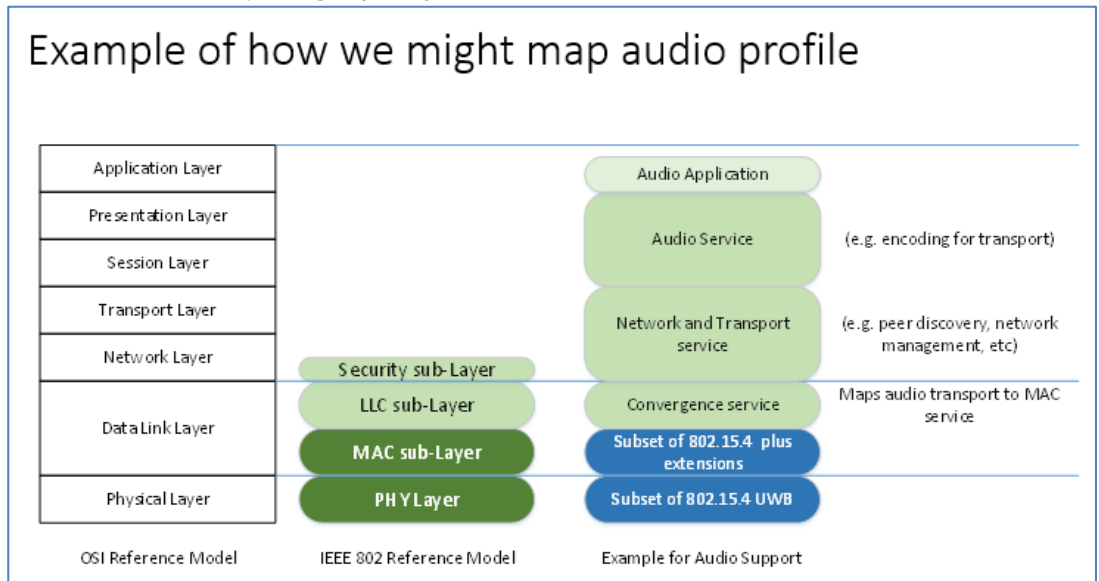
AES-X260 UWB Hi Res, Low Latency Audio Interface - Task Group SC-02-02-B

This document will describe the preferred way to implement connection management, assure consistent audio quality and provide for interoperable audio and feature control sets for the MAC convergence and application layers of UWB devices intended for high-quality audio use. Provide extensions to IEEE 802.15.4ab standard which defines connection, operating features and command structure in order to provide an interoperable interface between UWB audio capture and playback devices.

At the October 2023 meeting, the proponent gave a presentation (see slide) on how UWB can be used for high quality audio interfaces. It has low latency and has been

used with wireless mics in festival venues where conventional wireless mics would not work due to interference sources. UWB interfaces already exist in many consumer devices.

Example of how we might map audio profile



Status at meeting:
The group finally has permission to share the IEEE 802.15.4ab standard that UWB Hi Res, Low Latency audio uses. A small writing group has been formed. It seems that much of

the document will be constraints on clauses in the IEEE spec. to provide interoperability for the UWB application. The best way to do this is being debated (repeat clauses, adding constraints or reference IEEE clauses, adding constraints. The above slide has been retained to give some context to the work.



AES-X260 UWB Hi Res, Low Latency Audio Interface SC-02-02
May 23, 2024 standards meeting update

Scope:

Describe the preferred way to implement connection management, assure consistent audio quality, and provide for interoperable audio and feature control sets for the MAC convergence and application layers of UWB devices intended for high-quality audio use. Provide extensions to IEEE 802.15.4ab standard which defines connection, operating features and command structure in order to provide an interoperable interface between UWB audio capture and playback devices.

Update:

Goal = product manufacturers use common radio per AES standard and differentiate their performance/options in higher application layers via soft switches or hardware

Reviewing which UWB characteristics need to be common in order to accomplish interoperability

Discussing possible PHY and MAC options, with reference to IEEE clauses that would apply

- Keep same as IEEE PHY (likely selecting 2 of the options) so we work with existing chips

- Will select applicable MAC options where possible, and keep it as simple as possible

- Regarding Audio transport – should use an existing AES standard, review options

Regarding channel access – should review ETSI work

Also review 802.15.9 for MPX

We need to arrange formal IEEE/AES liaison in order to review the applicable clauses

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AES10-R Review of AES10-2020: AES Recommended Practice for Digital Audio Engineering - Serial Multichannel Audio Digital Interface (MADI)

Status at meeting:

The meeting agreed that the document will be proposed for reaffirmation.

AES11-R Review of AES11-2020: AES Recommended Practice for Digital Audio Engineering - Synchronization of digital audio equipment in studio operations.

Scope This document provides a recommended practice for manufacturers and users of digital audio equipment aimed at promoting economical and efficient methods for synchronizing interconnected digital audio equipment. The provisions make use of the two-channel digital audio interface standard for professional use, AES3. It is expected that the recommendations will be adopted for synchronizing all other digital audio interfaces. The document addresses two groups of parameters. The first concerns the performance requirements for the successful interchange of digital audio data between equipment. The second concerns the performance requirements for the regeneration of clocks used for analog-to-digital and digital-to-analog, conversion.

Status at meeting:

The meeting agreed that the document will be proposed for reaffirmation.

AES51-R Review of AES51-2020: AES standard for digital audio - Digital input-output interfacing - Transmission of ATM cells over Ethernet physical layer

Status at meeting:

The meeting agreed that the document will be proposed for reaffirmation.

AES50-R Review of AES50-2020, AES standard for digital audio engineering - High-resolution multi-channel audio interconnection (HRMAI)

Status at meeting:

The meeting agreed that the document will be proposed for reaffirmation.

AES-2id-R Review of AES-2id-2020: AES information document for digital audio engineering - Guidelines for the use of the AES3 interface

Status at meeting:

The meeting agreed that the document will be proposed for reaffirmation.

AES-10id-R Review of AES-10id-2020: AES information document for digital audio engineering - Engineering guidelines for the multichannel audio digital interface (MADI) AES10

Status at meeting:

The meeting agreed that the document will be proposed for reaffirmation.

Other SC-02-02 business

The group is also responsible for maintaining published documents:

- AES3-1-2009 (r2024), AES standard for digital audio - Digital input-output interfacing - Serial transmission format for two-channel linearly represented digital audio data
 - o Part 1: Audio Content
 - o Part 2: Metadata and Subcode
 - o Part 3: Transport
 - o Part 4: Physical and Electrical
- AES5-2018 (r2023): AES recommended practice for professional digital audio - Preferred sampling frequencies for applications employing pulse-code modulation
- AES41: AES standard for digital audio - Audio-embedded metadata
 - o Part 1: General
 - o Part 2: MPEG-1 Layer II or MPEG-2 LSF Layer II
 - o Part 3: AAC & HE-AAC
 - o Part 4: Dolby E
 - o Part 5: EBU loudness, true-peak, and downmix
- AES52-2006 r2022: AES standard for digital audio engineering - Insertion of unique identifiers into the AES3 transport stream

This large number of reaffirmations is an acknowledgement that these interfaces are still in use, but no further development is expected; IP transport has started to replace them

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- AES53-2018 (r2023): AES Standard for digital audio - Digital input-output interfacing - Sample-accurate timing in AES47
- AES55-2012 (r2022): AES standard for digital audio engineering - Carriage of MPEG Surround in an AES3 bitstream
- AES-R6-2020: Guidelines for AES50
- AES-R8-2020: Synchronisation of digital audio over wide areas

Working Group SC-02-08: Audio-File Transfer and Exchange Chair: Piotr Majdak; Vice-Chair: Markus Noisternig

- User implementation, and adoption of technologies for the exchange of audio data files and editing information among systems, by either transfer over a network or by exchange of physical media.

AES31-2-R Review of AES31-2-2019: Audio-file transfer and exchange - Part 2: File Format for Transferring Digital Audio Data Between Systems of Different Type and Manufacture

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

Status at meeting:

This document was opened for review to identify whether corrections are needed. The document does not cover 32-bit floating-point format, which has become popular in audio representation. Since the last meeting, a group member volunteered to create a revision to add the format. A draft document was submitted with the addition and minor improvements - however, it did not get to public Call-for-Comment before the website issues hit. The proponent suggested that a note about this change should be added to AES31-3 and AES31-4 (a SC-03-07 document).

AES69-R Review of AES69-2022: AES standard for file exchange - Spatial acoustic data file format

This document standardizes a file format to exchange space-related acoustic data in various forms. The format is designed to be scalable to match the available rendering process. The format is designed to be sufficiently flexible to include source materials from different databases.

This presentation was given at the May 2023 meeting. It explains the revision work proposed for AES69 on “Normalizing HRTF datasets”.

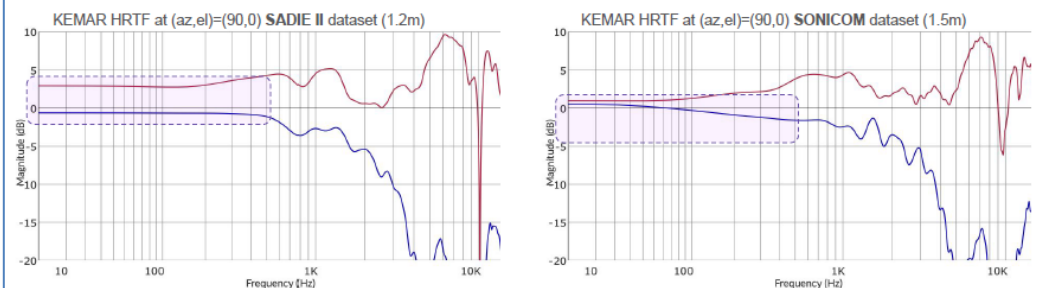
It is aimed at standardizing a number of parameters in HRTF data sets - the slide shows variation due to measured distance. This work was introduced at the Spring AES Convention.

There is continued interest in developing collaborative tools for document development and the AES69 Chair is working on a LaTeX template.

Genesis of the project

Problem Statement:

- Existence of multiple **published repositories of HRTF data** in a standardized format (SOFA)
- **Lack of standardization** for capture (e.g. measured distance) and post-processing (e.g. equalization) ⇒ publicly available databases **cannot be readily aggregated**
- Post-processing methods **impact HRTF data quality** and therefore influence binaural rendering quality (e.g. equalization, near-field artifacts, low-frequency equalization, etc.).



Hélène Bahu, Jean-Marc Jot and Peter Otto. (October 2023)

Status at meeting:

The following revisions to AES69 were proposed:

- Correction of typos relating to matrices, that could lead to implementation errors
- Addition to the standard to include work related to normalizing HRTF datasets (see above).

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The first item was done, but it never got to public Call for Comment due to the website issues. This will happen when Calls for Comment resume. The second item will be another revision to add the HRTF datasets work - expected to complete in 2026. It was explained that the problem is that the measurement technique needs to be tied down, in order to get more consistent results. There is no project initiated yet for this work.

Other SC-02-08 business

The group is also responsible for maintaining published documents:

- AES31-3-2021: AES standard for network and file transfer of audio - Audio-file transfer and exchange - Part 3: Simple project interchange.
Stabilized and Withdrawn:
- AES-21id-2011 (r2017), AES Information Document for audio-file transfer and exchange - Screen-less navigation for high-resolution audio on Blu-ray Disc [STABILIZED]
- AES31-1-2001 (r2011): AES standard for network and file transfer of audio - Audio-file transfer and exchange - Part 1: Disk format (STABILIZED)

Also, providing expertise to IEC for maintaining IEC 62942 Broadcast Wave File Format via project AES-X236

Working Group SC-02-12: Audio Applications of Networks Chair: Morton Lave; Vice-Chair Kevin Gross

- The use of various network types for audio and audio-related applications

See SMG monitored projects

Most of the current active projects in this Working Group are featured in our [SMG monitored projects section](#) above; media networks is where most recent action has been, also reflected by the much larger number of participants.

Other SC-02-12 business

The group has been informed that a new project would be initiated in the near future, defining a JSON format for AES70. It will be document AES70-4.

The group is also responsible for maintaining published documents:

- AES67-2023, AES standard for audio applications of networks - High-performance streaming audio over-IP interoperability (review due in 2028).
- AES71-2018 (r2023): AES Recommended Practice: Loudness Guidelines for Over the Top Television and Online Video Distribution (review due in 2028).
- AES77: AES Recommended Practice: Loudness Guidelines for Internet Audio Streaming and On-Demand Distribution (review due in 2028).
- AES-R10: AES Standards Report - Use cases for networks in professional audio
- AES-R16 AES Standards Report - PTP parameters for AES67 and SMPTE ST 2059-2 Interoperability (revised and published since last meeting round)
- AES-R20-2021: AES Standards Report - AES67 beyond the LAN

Stabilized and Withdrawn:

- AES58: AES Standard for audio applications of networks - Application of IEC 61883-6 32-bit generic data STABILIZED
- AES-R17: Standards project report - AES67 Interoperability PlugFest - London 2017 [STABILIZED]
- AES74-2019 (w2024) AES standard for audio applications of networks - Requirements for Media Network Directories and Directory Services WITHDRAWN



Working Group SC-03-06: Digital Library and Archive Systems

Chair: Nadja Wallaszkovits; Vice-Chair: Brad McCoy

- The application of digital technologies for media preservation and access

This WG restarted in 2020, having been closed for some years.

The subject matter may not be of great relevance to IABM members, but we will continue to attend to see how the work develops.

AES-X120 Liaison with International Association of Sound and Audiovisual Archives IASA

Their core std, TC-04, needed update and this led to the formation of the X255 project below. Their TC-04 group will review the X255 AES document.

Status at this meeting:

The group will continue to liaise with IASA, currently an informal relationship as there is already a lot of cross-membership. A current joint activity is putting together articles from the AES Journal and IASA Bulletin - sorting into topics and priority for republishing. The aim is to preserve the history of these technologies.

AES-X255 AES information document: Implementation of a Recommended Workflow for the Creation and Archiving of Analogue and Digital Archival Materials from Professional /Multitrack/ Multichannel Audio Production Formats

Scope: An AES Information Document. Implementation of a recommended workflow for the creation and archiving of digital archival materials from (analogue but also digital) professional audio production formats, such as: • Multichannel - multitrack • Quadraphonic formats (tape and disc) • Noise reduction systems • Surround sound

Status at this meeting:

The last draft document available to the group stood at 82 pages (revision continues, but the website problems prevent group access). The “meat” of the document is shown in the excerpt from the contents, right. Some annexes have been added. There has been consideration of including more information, but the task became too large - e.g. Producers and Engineers wing of the Recording Academy. There is some associated work going on to develop a metadata structure to merge with a simple script - this could form an addition to AES57. The draft document needs a clean-up to delete comments that have been incorporated and make the large document more manageable.

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Other SC-03-06 Business

The group is also responsible for maintaining published document:

AES57-2011 (r2022), AES standard for audio metadata - audio object structures for preservation and restoration.

Working Group SC-03-07: Audio Metadata
Chair: Kaylie Ackerman; Vice Chair: Vacant
- Formal descriptions and metadata sets for audio elements.

AES31-4-R: Review of AES31-4-2015: AES standard for network and file transport of audio - XML Implementation of Audio Decision Lists

AES31-4 is an xml representation of AES31-3 - Audio-file transfer and exchange - Part 3: Simple project interchange. It specifies the mapping between EDML elements, described in AES31-3, and their XML counterparts described in the included schema. The complete schema is included along with an XSLT document which provides a reference transform back to EDML for backwards compatibility.

Status at this meeting:

A revision was published September 2024, bringing it in line with a published AES31-3 revision. The document is up for review because the group decided that a note should be added that an additional data type had been added to AES31-2. There is no substantive change to AES31-4. There was a suggestion about moving this document to the File Transfer group, to keep all of the AES31-x documents together, but there was no firm decision on this.

AES60id-R Review of AES60id-2020, AES standard for audio metadata - Core audio metadata

The core set of metadata presented in this specification is based on the EBUCore, itself an extension to the Dublin Core. It is a minimum list of attributes characterizing audio and / or video media resources. The set of metadata defined in this specification has been identified as being the minimum information needed to describe radio and television content.

Status at this meeting:

The meeting agreed to propose that this document should be reaffirmed.

AES-X098C: AES standard for metadata - Process and handling history of audio objects

At an earlier meeting, Tormod Værvågen gave a presentation showing how X098 could be modeled as an extension to EBU CCDM (Class Conceptual Data Model; [EBU Tech 3351](#)).

EBU CCDM is itself an extension to EBUcore and it “collects” more data as events occur (e.g. publication events). The CCDM has recently been modified slightly to facilitate modelling X-098 as an add-on to AES60id.

Status at this meeting:

As the main author is no longer able to contribute, a decision was taken at this meeting to retire the project. Note: There continues to be a X098 project with the work to-date at this [GitHub location](#) (the .owl file is the ontology).

AES-X098C scope: to set out the vocabulary to be used in describing the processing and handling of audio objects in audio preservation work. This metadata, sometimes referred to as ‘process history’ or ‘digital provenance’, provides the ‘who’, ‘where’, ‘what’ and ‘how’ information that clarifies the provenance of the audio object with regard to the work that has been done to restore and/or preserve it. This vocabulary is an XML schema providing a structured human-readable instance document

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AES-X155: Production recording metadata set (iXML)

Member briefing: at an earlier meeting, a member informed the group that he has been validating iXML and has found problems. He added that we need to make it clear in X155 that the iXML chunk can happen anywhere in the file. These issues will have to be addressed in the rewrite.

There has been no progress since the last meeting. The author has made repeated requests for a real iXML file to test his schema; nothing received.

Status at this meeting:

A member present has received examples and will supply them to the group. Only the iXML chunk is required and the audio will be removed from these files.

Other SC-03-07 business

Two new items related to audio metadata were mentioned:

- <https://github.com/bitwig/dawproject> (like AES 31-3, but deeper)
- There will be a need to track metadata associated with C2PA; possible new project

The group is also responsible for maintaining published documents:

- AES-R9 AES standards project report - Considerations for standardizing AES metadata sets
- It is keeping in abeyance a project that was started but not completed:
- Best Practices for the Management of Embedded Metadata in Audio Files

AES-X155: will support communication of file- and project-based production metadata between audio stages of film and television workflow. iXML is primarily designed to write an embedded tagged data RIFF chunk inside a BWF file (it can be included in other file types). iXML standardizes current production metadata, with an extensible framework to add private or public data, while permitting expansion in a consistent and compatible manner.

This project was initiated in May 2008. Tormod Værvågen submitted a schema for this work in June 2010.

Working Group SC-05-02: Audio Connectors Chair: Fred Morgenstern; Vice-Chair: Anthony Kuzub

- New usage, description, and contact designation for connectors for audio and ancillary functions.

AES-X261 Polarity and pin configuration for linear balanced audio PCB connector (aka Euroblock)

Defines the number of pins used for each channel and the pin configuration for connecting +, -, signal conductors and cable shield for linear PCB connectors.

Both 3 pin and 6 pin (stereo) implementations are supported.

Status at Meeting

A main contributor to this work has been unable to work on it since the last meeting. The Chair will attempt to make contact to see if the project can continue. A draft was quite well advanced.

Other SC-05-02 business

The group is also responsible for maintaining published documents:

- AES59-2012 (r2023): Audio application of 25-way D-type connectors in balanced circuits (review due 2029)
- AES65-2012 (r2023): Connector for Surround Microphones (review due 2029)
- AES66-2012 (r2023): Application of connectors, miniature XLR-type polarity and gender (review due 2029)
- AES63-2024: AES standard for audio connectors - Data connector in an XLR connector shell (review due 2029)
- AES68-2014 (r2024): AES standard for audio connectors - XL Connectors to Improve Electromagnetic Compatibility (review due 2029)
- AES72-2019 (r2024): AES standard for audio connectors - Application of RJ45-type connectors to professional audio (review due 2029)

The group is also keeping an eye on single-pair ethernet connectors due to their compactness and suitability for carrying audio.

Working Group SC-05-05: Grounding and Electromagnetic Compatibility Practices
Chairs: Anthony Kuzub, Bill Whitlock

- All practices affecting usage and performance of audio hardware, with respect to the susceptibility of the signals it carries to effects such as noise and crosstalk due to the manner of its connection and construction, and the effects of its signals on other hardware and systems in its vicinity. It shall not set standards for personal safety with regard to such connections and construction but shall keep safety considerations in mind in its recommendations.

The AES-X152 project (Signal levels and impedances of analog audio interfaces) in this Working Group is featured in our SMG monitored projects section, [above](#).

AES-X249 AES standard on interconnections - Grounding and EMC practices - Shields of 25-way D-type connectors in balanced circuits

This work focuses on optimal grounding for DB25 connectors using AES59 pinouts and applying the principles established in AES48.

Although some problems have arisen due to the move from panel-mounted connectors to pcb-mounted connectors, in the case of grounding pins 2,5,8,11,16,19,22,25 on a DB25, that can probably be better achieved on a pcb ground plane.

Status at this meeting:

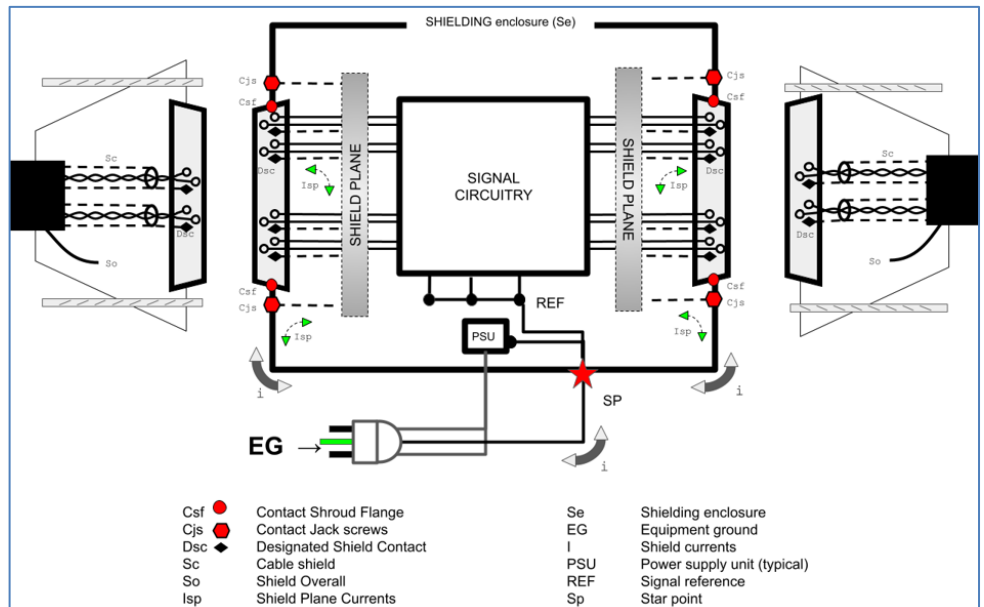
This document proposes additions to AES48 to cover shielding for 25-way D connectors in balanced circuits. The additions are complete and the standards manager will merge this content into the newly-reaffirmed AES48.

It includes the following definitions to be added to section 3:

- Csf (Contact Shroud Flange): A connector component designed to establish electrical contact between a metal enclosure and an external mating connector.
- Cjs (Contact Jack Screw): Hexagonal metal standoffs with threaded holes designed to receive screws. Contact Jack Screws are commonly used to securely fasten connectors, such as AES59 D-Sub connectors, to electronic devices or panels. They provide both mechanical support and electrical bonding.

A diagram was updated (right), showing the normal practice that the overall cable shield connection is not connected in most commercially available “snake” cables.

However, there was strong feeling at the previous meeting that best practice requires this connection at both ends; though ground loops can be a problem. An expression such as “effectively bonded at both ends” will probably be adopted.



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AES48-R Review of AES48-2019: AES standard on interconnections - Grounding and EMC practices - Shields of connectors in audio equipment containing active circuitry

Status at this meeting:

This document was reaffirmed in the last 6 months (likely to be kept open as a project to incorporate AES-X249 text; see above).

AES54-1-R Review of AES54-1-2008 (r2019): AES standard on interconnections - Grounding and EMC practices - Connection of cable shields within connectors attached to portable balanced audio cables

AES54-2-R Review of AES54-2-2008 (r2019): AES standard on interconnections - Grounding and EMC practices - Shields of balanced audio wiring within fixed and portable passive connector panels, jack fields, and passive microphone splitters

AES54-3-R Review of AES54-3-2008 (r2019): AES standard on interconnections - Grounding and EMC practices - Shields of balanced microphone-level outputs of active equipment other than microphones

Status at this meeting for the above 3 documents:

These three documents were reaffirmed in the last 6 months.

Other SC-05-05 business

The group is also responsible for maintaining published documents:

AES48 and the three parts of AES54 will be moved to this maintenance annex next time.

Recently Initiated Projects

Progress on these new projects will be noted in the assigned WG section of this report (if relevant).
No new projects in the last 6 months

AES-X261: Polarity and pin configuration for linear balanced audio PCB connectors

Project scope: Define the number of pins used for each channel and the pin configuration for connecting +, -, signal conductors and cable shield for linear PCB (aka euroblock) connectors.

The widespread adoption of PCB (aka euroblock) connectors without a pin configuration has led to many different varieties causing wiring mistakes, compromised noisy immunity, and added time to installs. Much of the industry has gravitated toward a (+/-/shield) configuration but it should be standardized. Furthermore, there are practical and technical considerations to avoid a 5-pin configuration for channel pairs.

Assigned to: SC-05-02 Status: Work beginning

Intent: Standard, Initiated: 2024-02-17 Target: TBA.

AES-X260: UWB Hi Res, Low Latency Audio Interface

Project scope: Describe the preferred way to implement connection management, assure consistent audio quality, and provide for interoperable audio and feature control sets for the MAC convergence and application layers of UWB devices intended for high-quality audio use. Provide extensions to IEEE 802.15.4ab standard which defines connection, operating features and command structure in order to provide an interoperable interface between UWB audio capture and playback devices.

Assigned to: SC-02-02, Status: Work beginning

Intent: Standard, Initiated: 2023-09-18, Target: 2024-12-31

AES-X259: (D259) Criteria for the authentication of digital audio recordings

Project scope: The purpose of this standard is to formulate a standard scientific procedure for the authentication of digital audio recordings intended to be offered as evidence or otherwise utilized in civil, criminal, or other fact-finding proceedings.

Assigned to: SC-03-12, Status: Work beginning

Intent: Standard, Initiated: 2023-09-12, Target: 2024-09-01

AES-X258: Using AES70 to manage Audinate Dante® media transport

Project scope: This standard specifies the use of AES70 to manage Audinate Dante® media stream connections between devices, where AES70 is used to control at least one of the devices, while other devices may be controlled using Audinate mechanisms or other out-of-scope means.

Assigned to: SC-02-12, Status: Work beginning

Intent: Standard, Initiated: 2023-04-14.

AES-X255: (D255) AES Guidelines for Audio Preservation and Restoration - Digital Archiving of Professional Audio Production Formats

Project scope: *Implementation of a recommended workflow for the creation and archiving of digital archival materials from (analogue but also digital) professional audio production formats, such as:* • Multichannel - multitrack • Quadraphonic formats (tape and disc) • Noise reduction systems • Surround sound

Assigned to: SC-03-06, Status: Initial development

Intent: Information Document, Initiated: 2022-01-09

Document actions since the last meeting round

Note that the disruption to AES Standards resources noted on page 2 has had an impact on all these document actions - I've done my best to add details, but new editions may not be available.

Public Calls-for-Comment:

New Publications / Revisions:

The Standards Manager notified the groups of some new documents being ready for publication, however they will not be available in the store until website problems are fixed.

Stabilized (still in-force, but not scheduled for review every 5 years):

None

Reaffirmed (validity extended for further 5 years from reaffirm date):

AES48-2019 (r2024) AES standard on interconnections - Grounding and EMC practices - Shields of connectors in audio equipment containing active circuitry
AES54-1-2008 (r2024): AES standard on interconnections - Grounding and EMC practices - Connection of cable shields within connectors attached to portable balanced audio cables
AES54-2-2008 (r2024): AES standard on interconnections - Grounding and EMC practices - Shields of balanced audio wiring within fixed and portable passive connector panels, jack fields, and passive microphone splitters
AES54-3-2008 (r2024): AES standard on interconnections - Grounding and EMC practices - Shields of balanced microphone-level outputs of active equipment other than microphones
AES-12id AES information document for digital audio measurements - Jitter performance specifications
AES68-2014 (r2024): AES standard for audio connectors - XL Connectors to Improve Electromagnetic Compatibility
AES72-2019 (r2024): AES standard for audio connectors - Application of RJ45-type connectors to professional audio

Withdrawn (where it may be harmful in a present-day context):

AES74-2019 (w2024) AES standard for audio applications of networks - Requirements for Media Network Directories and Directory Services WITHDRAWN - too much of a moving target

AES Standards Committee Process

Structure

AES Standards Committees produce Standards, Information Documents and Reports. The AES Standards Committee, chaired by Bruce Olson, is currently structured into these sub-committees (SC's):

[SC-00: Stabilized Standards](#)

chaired by Richard Cabot

[SC-02: Digital Audio](#)

chaired by John Grant

[SC-03: Preservation and Restoration of Audio Recording](#)

chaired Nadja Wallaszkovits

[SC-04: Acoustics](#)

chaired by David Josephson

[SC-05: Interconnections](#)

chaired by Bruce Olson

The above links go to an AES page that gives the SC's scope, and the scope for any Working Groups (WG's) under each SC (as constrained by the SC scope).

WG's are identified "SC-sc-wg" e.g. SC-02-02 is an SC-02 WG on Digital Input-Output Interfaces. A WG may be held "dormant" if it has no current work, but the expectation of future work.

There may also be Task Groups (TGs) under a WG and TGs usually have a specific project to work on - though some projects, usually smaller ones, are done in the WG itself. e.g. SC-02-12-M is a SC-02-12 task group on AES67.

Projects

Projects are numbered thus:

AESnn-R is a review of an existing document nn

AES-Xnnn is a new project with no publication number yet assigned.

Document development states are identified thus:

PTD: Proposed task group draft.

PWD: Proposed working group draft

PCFC: Proposed call for comment - a checking stage prior to:

CFC: Call for Comment - a 6-week period for public comment before publication.

Using this document

This report starts by covering the projects that are monitored in the IABM's Standards Monitoring Group (SMG). These are believed to be the highest priority for our members.

It then covers the remaining projects in those Working Groups most relevant to the Broadcast and Media Industry:

[Digital Audio Measurements](#)

[Digital I/O Interfaces](#)

[Audio-File Transfer and Exchange](#)

[Audio Applications of Networks](#)

[Digital Library and Archive Systems](#)

[Audio Metadata](#)

[Audio Connectors](#)

[Grounding and EMC Practices](#)

Links in the header of pages allow easy navigation between WG's

We then list the projects, calls for comment and document publications since the last report.