

AES standard method for digital audio engineering – Measurement of digital audio equipment

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Abstract

This standard provides methods for specifying and verifying the performance of digital audio equipment. Many tests are substantially identical to those used when testing analog equipment. However, because of the unique requirements of digital audio equipment and the effects of its imperfections, additional tests are necessary.

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Foreword

[This foreword is not a part of *AES standard method for digital audio engineering — Measurement of digital audio equipment*, AES17-1998]

This document has been prepared by the SC-02-01 Working Group on Digital Audio Measurement Techniques of the SC-02 Subcommittee on Digital Audio of the Audio Engineering Society Standards Committee. It is a revision of AES17-1991. With the permission of AESSC, it also had been independently released by ANSI Accredited Standards Committee S4 as ANSI S4.51-1991.

Discussions on the revision project, AES17-R, began in the autumn of 1995. Proposals for revision have been discussed at five subsequent open working group meetings and over the working group reflector, SC_02_01@aessc.aes.org. The call for comment on its draft was published 1997-10-09 on <http://www.aes.org/standards> and was distributed with the *Journal of the Audio Engineering Society*, vol. 45, no. 11. The comment record is posted at <http://www.aes.org/standards/comments>.

The following individuals contributed to the preparation of the 1991 edition of this document: Robert Adams, Richard Cabot, Louis Fielder, David Haynes, and Tomlinson Holman. The revision was prepared by R. Cabot based on the working group discussions.

Richard Cabot, Chairman
Working Group SC-02-01 on Digital Audio Measurement Techniques
1998-03

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”.

Addendum 2010-04-07

A revised multi-part revision of AES3 was published in 2009. Its technical content is intended to be identical to the relevant parts of the 2003 edition as amended by Amendment 5 (2008) and Amendment 6 (2008). An informative note has been added to the normative references.

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AES standard method for digital audio engineering — Measurement of digital audio equipment

1 Scope

This standard provides methods for specifying and verifying the performance of digital audio equipment. It describes the testing of medium- and high-performance digital audio equipment. The characteristics of voice-grade digital audio devices are sufficiently different from those of high-performance equipment that some of the test levels and frequencies specified in this document may need to be revised for such applications. Low-bit-rate coders are an example of devices that will require additional test techniques to be developed. The nature of such coders dictates that the test methods be based on psychoacoustic models which can predict audible performance. However, the techniques described here should still be informative for such systems. Another caveat concerns digital devices which purposely modify the time-domain characteristics of the audio signal, such as pitch shifters and reverberators. Many of the tests in this standard were prepared assuming that the frequency spectrum of the output signal is substantially the same as that of the input signal. Also, large-amplitude interfering signals (as would be encountered with reverberators) have not been considered.

Many tests are substantially identical to those used when testing analog equipment. However, because of the unique requirements of digital audio equipment and the effects of its imperfections, additional tests are necessary. Some tests have been omitted while the appropriate modifications required for use in testing digital audio systems are being developed.

2 Normative references

The following standards contain provisions that, 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.

AES3-1992, *AES recommended practice for digital audio engineering — Serial transmission format for two-channel linearly represented digital audio data*. New York, NY, USA: Audio Engineering Society, 1992.

ITU-R BS.468-4, *Measurement of audio-frequency noise voltage in sound broadcasting*. Geneva, Switzerland: International Telecommunication Union, 1986.

IEC 61260 (1995-08), *Electroacoustics — Octave-band and fractional-octave-band filters*. Geneva, Switzerland: International Electrotechnical Commission, 1995.

IEC 60268-3 (1988-09), *Sound system equipment Part 3: Amplifiers*. Geneva, Switzerland: International Electrotechnical Commission, 1988.

NOTE A revised multi-part revision of AES3 was published in 2009. Its technical content is intended to be identical to the relevant parts of the 2003 edition as amended by Amendment 5 (2008) and Amendment 6 (2008).

3 Definitions and abbreviations

For the purposes of this standard, the following definitions apply.

3.1

folding frequency

one-half the sampling frequency of the digital system

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