

**AES recommended practice  
for professional audio  
interconnections —  
Conservation of the polarity of  
audio signals**

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**Abstract**

This document standardizes the polarity of the signals at the various interface points between different items of equipment, in particular from the acoustical, electrical, mechanical, digital, and magnetic aspects. Each item of equipment complies separately with the polarity requirements for the input and output signals.

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## Foreword

[This foreword is not a part of *AES recommended practice for professional audio interconnections— Conservation of the polarity of audio signals*, AES26-2001.]

### Foreword to original edition

In the early days of audio engineering, it was seldom thought necessary to pay attention to the polarity of audio signals, but since the introduction of multichannel techniques, and in particular stereophony, this has become essential in order to permit the satisfactory combination of signals from different sources. Conservation of polarity on a local basis is easy to achieve in isolation, but the satisfactory interconnection of equipment obtained from the manufacturers that supply an international market requires international standardization. For this reason, the AES has prepared this standard, which is concerned only with polarity, and not, for example, with signal levels, impedances, or mechanical characteristics of the connections within audio systems. It is based partially on EBU Technical Recommendation R 50-1990 (E), *Conservation of the Polarity of Audio Signals in Radio and Television Production Installations*, and is completely consistent with the technical requirements of that document except as specifically noted here.

In order to ensure that the correct polarity is maintained throughout the audio production chain, it is necessary to standardize the polarity of the signals at the various interface points between different items of equipment, in particular from the acoustical, electrical, mechanical, digital, and magnetic aspects. Each item of equipment should comply separately with the polarity requirements for the input and output signals.

The writing group that drafted the first edition of this document (1995) consisted of Andrew J. Condon, Neal E. Edwards, Gary H. Hedden, Irving L. Joel, James P. Jordan, Stanley P. Lipshitz, Edward M. Long, John G. McKnight, Cal Perkins, Daniel Queen, Saul A. Walker, Bernhard A. Weingartner, Conrad J. White, and John M. Woodgate.

John G. McKnight, chair  
AESSC SC-05-01 Working Group on Conservation of Polarity  
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### Foreword to second edition

The writing group of SC-05-01 that drafted the second edition of this document consisted of J. Brown, R. H. Campbell, G. H. Hedden, I. L. Joel, E. M. Long, J. G. McKnight, B. Olson, D. Prince, R. Rayburn, J. Schmidt, B. A. Weingartner, C. J. White, and J. M. Woodgate.

J. G. McKnight, chair  
J. Schmidt, vice-chair  
SC-05-01 Working Group on Polarity  
2001-03-08

### Note on normative language

In AES standards documents, sentences containing the verb "shall" are requirements for compliance with the standard. Sentences containing the verb "should" are strong suggestions (recommendations). Sentences giving permission use the verb "may." Sentences expressing a possibility use the verb "can." The decimal point is a comma except in coding, where it is a period.

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# AES recommended practice for professional audio interconnections — Conservation of the polarity of audio signals

## 1 Scope

This standard provides a means to ensure that correct polarity is maintained throughout an audio production chain by determining the polarity of the signals at the various interface points between different items of equipment, in particular at the acoustical, electrical, mechanical, digital, and magnetic ports. The standard intends that each item of equipment comply separately with the polarity requirements for the input and output signals. The preservation of signal polarity in audio recording and processing is important for two main reasons:

- a) the polarity relationship between channels of a stereo pair or multichannel set of signals is of fundamental importance in the correct re-creation of the sound field;
- b) some audio signals are sufficiently asymmetrical that polarity inversion may be perceptually detected.

NOTE This standard is consistent with IEC 60268-2 and IEC 61213.

## 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.

Some referenced excerpts are available on the databases page of [www.aes.org/standards/](http://www.aes.org/standards/).

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

AES14-1992, *AES standard for professional audio equipment — Application of connectors, part 1, XLR-type polarity and gender*. New York, US: Audio Engineering Society.

IEC 60094-1 (1981-01), *Magnetic tape sound recording and reproducing systems — Part 1: General conditions and requirements*. Geneva, CH: International Electrotechnical Commission.

IEC 60098 (1987-11), *Analog audio disk records and reproducing equipment*. Geneva, CH: International Electrotechnical Commission.

IEC 60268-2 (1987-06), *Sound system equipment — Part 2: Explanation of general terms and calculation methods*. Geneva, CH: International Electrotechnical Commission.

IEC 60268-12 (1987-03), *Sound system equipment — Part 12: Application of connectors for broadcast and similar use*. Geneva, CH: International Electrotechnical Commission.

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### 3 Definitions

#### 3.1

**positive-polarity audio signal****instantaneous positive audio signal****positive polarity**

audio signal in any transmission medium (acoustical, mechanical, electrical, magnetic, modulated carrier, and so on) that would result from an increase (over the static atmospheric pressure) of the instantaneous acoustic pressure on the diaphragm of a pressure microphone, which causes displacement of the diaphragm away from the sound entrance

NOTE 1 The polarity of a laboratory standard microphone conforming to IEC 61094-1 is not included in this standard.

NOTE 2 Electrostatic (capacitor) measurement microphones have traditionally employed positive voltage polarization of the diaphragm versus the back plate of the transducer. Given the typical non-inverting impedance matching electronics used, the result is negative going output voltage for positive sound pressure, opposite to the professional audio standard.

#### 3.2

**magnetic analog audio tape**

recording medium as described in IEC 60094-1 and any of the subsequent parts of IEC 60094

#### 3.3

**magnetic videotape**

recording medium intended for video recording and containing analog audio information as in IEC 60712, IEC 60767, and IEC 60774

#### 3.4

**XLR connector**

connector meeting the requirements of IEC 60268-12, subclause 3.1, and of AES14