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AMERICAN NATIONAL STANDARD

Method for Measuring the Intelligibility of Speech over Communication Systems

ANSI/ASA S3.2-2009

Accredited Standards Committee S3, Bioacoustics

Standards Secretariat
Acoustical Society of America
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AMERICAN NATIONAL STANDARD

**Method for Measuring the Intelligibility of
Speech over Communication Systems**

Secretariat:

Acoustical Society of America

Approved May 13, 2009 by:

American National Standards Institute, Inc.

Abstract

This standard is a revision of ANSI S3.2-1989 (R 1999) American National Standard Method for Measuring the Intelligibility of Speech over Communication Systems. The standard provides three alternative sets of lists of English words to be spoken by trained talkers over the speech communication system to be evaluated. The selection of the particular set of word lists depends upon the purpose and constraints of the test situation. Trained listeners record the words they hear. The fraction of the words they identify correctly is the measure of the intelligibility of speech over the system. The system may consist of the air and the room or outdoors in face-to-face communications; the equipment and environments used in telephony, public address systems, or ordinary radio; or complex systems of environment, equipment, and air, wire, fiber, radio, and water paths used in some military, space, remote, or emergency communications. The standard specifies test materials that have been thoroughly validated. The standard also specifies methods for selecting and training the talkers and listeners; for designing, controlling, and reporting the test conditions; and for analyzing and reporting the test results.

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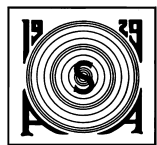
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Foreword

[This Foreword is for information only, and is not a part of the American National Standard ANSI/ASA S3.2-2009 American National Standard Method for Measuring the Intelligibility of Speech over Communication Systems.]

This standard comprises a part of a group of definitions, standards, and specifications for use in bioacoustics. It was developed and approved by Accredited Standards Committee S3, Bioacoustics, under its approved operating procedures. Those procedures have been accredited by the American National Standards Institute (ANSI). The Scope of Accredited Standards Committee S3 is as follows:

Standards, specifications, methods of measurement and test, and terminology in the fields of psychological and physiological acoustics, including aspects of general acoustics which pertain to biological safety, tolerance and comfort.

This standard is a revision of ANSI S3.2-1989, which has been technically revised. The previous version cited the draft of an ANSI standard for the calibration of speech that was never approved or published. A section was added to Clause 7 that provides guidelines for calibration. The section on calibration discusses documentation of speaking levels, listening levels, and signal-to-noise ratios for field applications and for measurements obtained under laboratory conditions. This standard is not comparable to any existing International Standard Organization (ISO) Standard.

At the time this Standard was submitted to Accredited Standards Committee S3, Bioacoustics, for approval, the membership was as follows:

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Suggestions for improvements to this standard will be welcomed. They should be sent to Accredited Standards Committee S3, Bioacoustics, in care of the Standards Secretariat of the Acoustical Society of America, 35 Pinelawn Road, Suite 114E, Melville, New York 11747-3177. Telephone: 631-390-0215; FAX: 631-390-0217; E-mail: asastds@aip.org.

American National Standard

Method for Measuring the Intelligibility of Speech over Communication Systems

1 Scope

1.1 Scope and limitations

The scope of this standard includes the measurement of the intelligibility of speech over entire communication systems and the evaluation of the contributions of elements of speech communication systems. The scope also includes evaluation of the factors that affect the intelligibility of speech.

In this standard the intelligibility of speech over a speech communication system is measured by comparing the monosyllabic words trained listeners receive and identify with the words trained talkers or speech coders speak into a communication system that connects the talkers (or speech coders) with the listeners. The standard requires the intelligibility measurements to be made with talkers and listeners who are native speakers of English and who have no speech or hearing defects.

Limitations. This standard specifies what should be measured and reported to assess a communication system, but it does not specify the test conditions. This limitation prohibits comparisons between evaluations done under different test conditions.

This standard is not intended for use in evaluating automatic speech recognition devices; the sets of speech materials specified in this standard have not been shown to be appropriate or valid for testing systems that include such devices.

This standard is not intended for use in evaluating the intelligibility of text-to-speech systems; the sets of speech materials specified in this standard have not been shown to be appropriate or valid for testing such systems.

This standard is not intended for use in evaluating the articulatory abilities of talkers with speech disorders or for use in evaluating the speech discrimination abilities of listeners with hearing deficiencies.

This standard is not intended for use in evaluating listeners' abilities to identify talkers or their emotional state. Neither is the standard intended for use in evaluating the overall quality of a speech communication system.

1.2 Purpose

The purpose of this standard is to establish uniform methods for measuring the intelligibility of speech over communication systems. The measurement process involves *talkers*, in their environment, who speak test words into a *transmission path* to *listeners*, who receive and identify the speech in their environment. Figure 1 shows a simple block diagram of such a measurement system.

This standard is intended to be particularly useful to the following groups:

- Preparers of specifications for the performance of speech communication systems, equipment, and facilities;
- Architects and consulting engineers who design spaces and equipment for speech communication;