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AMERICAN NATIONAL STANDARD

**Recommendations for the Specifying and Testing
the Susceptibility of Acoustical Instruments to
Radiated Radio-Frequency Electromagnetic Fields,
25 MHz to 1 GHz**

Secretariat:

Acoustical Society of America

Approved on 7 July 1998:

American National Standards Institute, Inc.

Abstract

This Standard provides recommendations for specifying and testing the susceptibility of acoustical instruments to radiated radio-frequency electromagnetic fields. This Standard does not contain recommendations regarding the susceptibility of an instrument to conducted electromagnetic fields, or recommendations to limit the emission of electromagnetic fields from instruments. The Standard covers two ranges of radio frequencies for the carrier signal: 25 MHz to 500 MHz, and an extended range from 25 MHz to 1 GHz. Recommended maximum electric field strengths for the radio-frequency field are 3 V/m, 10 V/m, and 61.4 V/m. An electric field strength greater than 61.4 V/m may be selected for specific applications. The Standard recommends limits, relative to the overall performance category of an acoustical instrument, of allowable deviation from nominal performance in the absence of a radio-frequency field.

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**RECOMMENDATIONS FOR
SPECIFYING AND TESTING THE
SUSCEPTIBILITY OF ACOUSTICAL
INSTRUMENTS TO RADIATED RADIO-
FREQUENCY ELECTROMAGNETIC
FIELDS, 25 MHz TO 1 GHz**

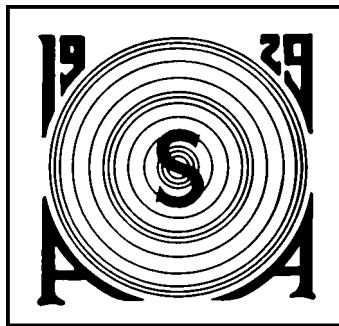
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Accredited Standards Committee S1, Acoustics

Standards Secretariat
Acoustical Society of America
120 Wall Street, 32nd Floor
New York, New York 10005-3993

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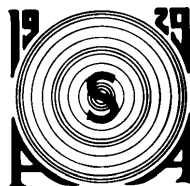
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Standards Secretariat
Acoustical Society of America
120 Wall Street, 32nd Floor
New York, New York 10005-3993
USA

Telephone: +1 212 248 0373
Telefax: +1 212 248 0146
E-mail: asastds@aip.org
Internet: <http://asa.aip.org>

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Foreword

[This Foreword is for information only and is not an integral part of *American National Standard Recommendations for Specifying and Testing the Susceptibility of Acoustical Instruments to Radiated Radio-frequency Electromagnetic Fields, 25 MHz to 1 GHz*, ANSI S1.14-1998.]

This Standard was developed under the jurisdiction of Accredited Standards Committee S1, Acoustics, which has the following scope:

Standards, specifications, methods of measurement and test, and terminology in the fields of physical acoustics including architectural acoustics, electro-acoustics, sonics and ultrasonics, and underwater sound, but excluding those aspects which pertain to biological safety, tolerance, and comfort.

At the time this Standard was submitted to Accredited Standards Committee S1, Acoustics, for final approval, the membership was as follows:

J. P. Seiler, *Chair*
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U.S. Army Construction Engineering Research Laboratories (USA-CERL)	P. D. Schomer M. J. White (<i>Alt.</i>)

Individual Experts of Accredited Standards Committee S1, Acoustics, were:

J. R. Bareham	R. M. Guernsey	A. H. Marsh
S. L. Ehrlich	D. L. Johnson	L. W. Sepmeyer
K. M. Eldred	T. J. Kuemmel	H. E. von Gierke
W. J. Galloway	W. W. Lang	G. S. K. Wong
E. E. Gross, Jr.	G. C. Maling, Jr.	R. W. Young

Working Group S1/WG21, Electromagnetic Susceptibility of Acoustical Instruments, which assisted Accredited Standards Committee S1, Acoustics, in the preparation of this Standard, had the following membership:

J. P. Seiler, *Chair*

J. M. Blick	R. W. Krug	V. Nedzelnitsky
R. F. Feldman	T. J. Kuemmel	R. G. Tyler
	A. H. Marsh	

Suggestions for improvement of this Standard will be welcomed. They should be made in writing to Accredited Standards Committee S1, Acoustics, in care of the Standards Secretariat, Acoustical Society of America, 120 Wall Street, 32nd Floor, New York, New York 10005-3993, USA. E-mail: asastds@aip.org, Telephone: +1 212 248 0373; Fax +1 212 248 0146.

American National Standard

Recommendations for Specifying and Testing the Susceptibility of Acoustical Instruments to Radiated Radio-frequency Electromagnetic Fields, 25 MHz to 1 GHz

0 Introduction

0.1 Acoustical instruments are used to measure or generate sound in situations such as occupational exposure to noise, laboratory experiments, instrument calibrations, and noise control assessments. The instrument should operate properly under the prevailing environmental conditions, including the presence of radio-frequency electromagnetic fields.

0.2 Electromagnetic fields are produced by fixed sources and by devices such as hand-held radio transceivers or radio telephones. Exposure to a significant electromagnetic field can result in erroneous data, unwanted results, false alarms, or even complete shutdown of an instrument.

0.3 The electromagnetic susceptibility of an instrument depends on the frequency, amplitude, and modulation of the electromagnetic field. Instruments showing no effect from electromagnetic signals at one frequency may behave differently at another frequency. An instrument's physical dimensions, electrical characteristics, internal shielding, and positioning all influence the frequency dependence. The microphone cable on an acoustical instrument can act as an antenna and couple a radio-frequency electromagnetic field to the instrument.

0.4 The specifications recommended in this Standard were considered to provide reasonable protection against interference from radiated electromagnetic fields. However, in some situations, an acoustical instrument that conforms to the ap-

plicable specifications may still be adversely affected by a particular radio-frequency field.

1 Scope

1.1 This Standard provides recommendations for specifying and testing the susceptibility of acoustical instruments to radiated electromagnetic fields. The instruments may be powered by batteries or from a public supply of electric power. Recommendations related to testing an instrument's susceptibility to electromagnetic radiation are given in annex A. Annex B contains a bibliography of background information.

1.2 The Standard does not contain recommendations for specifying and testing the susceptibility of an acoustical instrument to conducted electromagnetic fields. The Standard does not contain recommendations to limit the radio-frequency electromagnetic fields that may be radiated by an acoustical instrument. It does not provide recommendations for the influence of radio-frequency fields on optional external cabling or ancillary devices. The Standard is not applicable to audio-meters or hearing aids.

1.3 This Standard provides recommendations for electric and magnetic field strengths and for radio-frequency and acoustical test signals.

1.4 The Standard covers the range of radio frequencies from 25 MHz to 500 MHz, and an extended range from 25 MHz to 1 GHz (corresponding to wavelengths from 12 m to 0.333 m).

1.5 The recommendations of this Standard may be used to develop radio-frequency electromagnetic susceptibility requirements for specific acoustical instruments. For individual instrument standards, the recommended specifications for electromagnetic test-signal frequencies, and maximum field strengths, or any other recommendation of this Standard, may be modified as appropriate.

2 Definitions

Some definitions were adopted from ANSI/IEEE 100-1984, *IEEE Standard Dictionary of Electrical and Electronic Terms* or ANSI C63.14-1992, *American National Standard Dictionary for Technologies of Electromagnetic Compatibility (EMC), Electromagnetic Pulse (EMP), and Electrostatic Discharge (ESD)*. In some cases, the definitions were edited to apply to this Standard.