

CEA Standard

NTSC/ATSC Loudness Matching

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FOREWORD

This bulletin was developed under the auspices of the Consumer Electronics Association (CEA) R4 Video Systems Committee.

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NTSC/ATSC Loudness Matching

1 Scope

This bulletin provides guidance on maintaining uniform audio loudness between existing NTSC audio services and DTV audio services while preserving the dynamic range delivery capability of the DTV service.

This bulletin applies to any consumer digital television broadcast receiver that is capable of also receiving NTSC analog program channels.

This bulletin addresses optimal output specifications, gain structure, and capability of consumer broadcast products to match loudness from the viewer perspective.

2 Informative References

2.1 Informative References List

ATSC A/52A Digital Audio Compression Standard, August 20, 2001

IEC 61938, Audio, video and audiovisual systems- Interconnections and matching values- Preferred matching values of analogue signals, December 1996

IEC 60804, Integrating-averaging sound level meters, Second edition, October 2000

IEC 60651, Sound Level Meters, Consol edition 1.2, October 2001

ISO 532-1975 Acoustics – Method for calculating loudness level

FCC OET Bulletin No. 60 Multichannel Television Sound Transmission And Audio Processing requirements for the BTSC system. Revision A, February 1986

2.2 Informative References Acquisition

ATSC Standards:

- Advanced Television Systems Committee (ATSC), 1750 K Street N.W., Suite 1200, Washington, DC 20006; Phone 202-828-3130; Fax 202-828-3131; Internet <http://www.atsc.org/stan&rps.html>

IEC/ISO Standards:

- Global Engineering Documents, World Headquarters, 15 Inverness Way East, Englewood, CO USA 80112-5776; Phone 800-854-7179; Fax 303-397-2740; Internet <http://global.ihs.com>; Email global@ihs.com
- IEC Central Office, 3, rue de Varembe, PO Box 131, CH-1211 Geneva 20, Switzerland; Phone +41 22 919 02 11; Fax +41 22 919 03 00; Internet <http://www.iec.ch>; Email pubinfor@iec.ch

3 Glossary

ADC	Analog to digital converter.
compr	A metadata control word contained in Dolby Digital (AC-3) bitstreams that introduces limiting when the decoder is in the RF operating mode.
DAC	Digital to analog converter.
dBFS	Acronym for decibels with respect to full scale.
dialnorm	A metadata control word contained in Dolby Digital (AC-3) bitstreams that adjusts or normalizes decoder gain to achieve normalized loudness or “dialog” level.
Leq(A)	A method of measuring audio loudness using an A weighted integrating-averaging sound level meter.
PCM	Abbreviation for pulse code modulation. PCM is sometimes used in the industry to describe digital audio signals or audio output format.
RMS	Root mean square.