

# CEA Bulletin

## NTSC/ATSC LOUDNESS MATCHING

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(Formulated under the cognizance of the CEA's **R4 Video Systems Committee**.)

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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 program loudness between various combinations of analog sources, NTSC services, and digitally delivered terrestrial DTV, satellite and / or cable services while preserving the dynamic range delivery capability of the DTV service.

This bulletin addresses the source levels, gain structure and output levels of any consumer digital television broadcast receiver, set top box, integrated AV receiver or similar device that is capable of receiving any or all of the above services.

### 2 Informative References

#### 2.1 Informative References List

ATSC A/52B Digital Audio Compression (AC-3, E-AC-3) Standard, June 14, 2005

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

ITU-R BS.1770, Algorithms to Measure Programme Loudness & True Peak Audio Level

IEC 61672-1, Electroacoustics - Sound level meters - Part 1: Specifications, May 29, 2002 AND IEC 61672-2, Electroacoustics - Sound level meters - Part 2: Pattern evaluation tests, April 16, 2003

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 202-872-9160; Fax 202-872-9161; 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](mailto:global@ihs.com)  
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FCC Bulletins:

- Federal Communications Commission, 445 12th Street, SW, Washington, DC 20554

ITU Documents:

- ITU documents are available through the web at <http://www.itu.int/opb/>

### 3 Glossary

ADC	Analog to digital converter.
compr	A metadata control word contained in AC-3 bitstreams that introduces limiting when the decoder is in the RF operating mode, and downmix overload protection in all modes.
DAC	Digital to analog converter.
dBFM	
dBFS	Acronym for decibels with respect to full scale.