



Recommendation ITU-R BS.1771-1
(01/2012)

**Requirements for loudness and true-peak
indicating meters**

BS Series
Broadcasting service (sound)



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SA	Space applications and meteorology
SF	Frequency sharing and coordination between fixed-satellite and fixed service systems
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SNG	Satellite news gathering
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Note: This ITU-R Recommendation was approved in English under the procedure detailed in Resolution ITU-R 1.

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RECOMMENDATION ITU-R BS.1771-1*

Requirements for loudness and true-peak indicating meters

(Question ITU-R 2/6)

(2006-2012)

Scope

This Recommendation specifies some requirements for audio metering devices that implement the loudness and true-peak algorithms specified in other ITU-R Recommendations.

The ITU Radiocommunication Assembly,

considering

- a) that neither the VU meter nor a conventional peak programme meter gives an accurate indication of subjective loudness;
- b) that neither the VU meter nor a conventional peak programme meter gives an accurate indication of the true-peak level of a digital signal;
- c) that listeners may desire the subjective loudness of audio programmes to be similar for different sources and different programme types;
- d) that the true-peak level of a digital signal may be larger than the maximum sample value;
- e) that Recommendation ITU-R BS.1770 – Algorithms to measure audio programme loudness and true-peak audio level, specifies the measurement of programme loudness and of true-peak levels;
- f) that the state of digital signal processing makes it practical to implement these algorithms in a cost-effective metering device;
- g) that broadcasters have requirements that should be satisfied by meters used to indicate programme loudness and true-peak level,

recommends

- 1 that audio meters employed to measure programme loudness, and/or to indicate true-peak level to assist in the avoidance of overload of digital audio signals, should meet the requirements specified in Annex 1 and Annex 2;
- 2 that Note 1 be considered as part of the Recommendation

NOTE 1 – Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g. interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words “shall” or some other obligatory language such as “must” and the negative equivalents are used to express requirements. The use of such words shall in no way be construed to imply partial or total compliance with this Recommendation.

* Radiocommunication Study Group 6 made editorial amendments to this Recommendation in October 2010 in accordance with Resolution ITU-R 1.

Annex 1

Requirements for loudness and true-peak indicating meters

Introduction

The purpose of this Annex is to specify requirements for programme loudness and peak indicating meters.

Scope

This Annex outlines requirements for a meter designed for three purposes:

- a) For instrument-based prediction of subjective loudness of sound programme, measured over a short term.
- b) For instrument-based prediction of subjective loudness of sound programme, measured over a longer period.
- c) Optionally, for indication of programme signal peaks.

This meter may be used to assist a conventional meter or it may be used instead of a conventional meter.

There shall be two categories of electronic display, called Type I and Type II. These displays shall differ only in resolution. The Type I display is intended for studio use. The Type II display is intended for portable equipment where size, weight and power consumption must be minimized.

Definitions

Loudness unit (LU)	The loudness unit is the scale unit of the loudness meter. The value of the programme in loudness units represents the loss or gain (dB) that is required to bring the programme to 0 LU, e.g. a programme that reads –10 LU will require 10 dB of gain to bring that programme up to a reading of 0 LU.
Momentary loudness	Momentary loudness is defined as the ungated loudness in Recommendation ITU-R BS.1770 loudness algorithm when passed through a first-order IIR (infinite impulse response) low-pass filter with a 400 ms time-constant, as described in further detail in Annex 2 of this Recommendation.
Short-term loudness	Short-term loudness is defined as the ungated loudness in Recommendation ITU-R BS.1770 loudness algorithm when integrated over an interval of 3 seconds, as described in further detail in Annex 2 of this Recommendation.
Type I electronic display	Electronic display with a resolution of one or more segments per loudness unit.
Type II electronic display.	Electronic display with a resolution of one segment for 3 loudness units.