

RECOMMENDATION ITU-R BS.1726*

Signal level of digital audio accompanying television in international programme exchange

(2005)

Scope

This Recommendation gives guidance on the level of digital audio signals accompanying television in international programme exchange. The Recommendation specifies that one of two specified reference levels (−18 dBFS or −20 dBFS) be employed and declared, and that peak audio levels, when measured by a quasi-peak programme meter (PPM), do not exceed a level of −9 dBFS.

Keywords

Reference level, digital audio signal

The ITU Radiocommunication Assembly,

considering

- a) that Recommendation ITU-R BS.645 – Test signals and metering to be used on international sound programme connections, specifies metering characteristics and signal levels for analogue audio programmes;
- b) that international programme exchange is now generally based on the use of digital techniques;
- c) that modern digital techniques support a very wide dynamic range of levels for audio signals;
- d) that digital media overload abruptly and thus even momentary overload should be avoided;
- e) that a uniform audio level is highly desirable in the international exchange of television programmes, and this can only be achieved through the use of uniform operating practices;
- f) that the European Broadcasting Union (EBU) Technical Recommendation R68-2000 and the Society for Motion Picture & Television Engineer (SMPTE) RP 155 – 2014 operating practices are based on two different audio reference levels, namely −18 dBFS¹ and −20 dBFS respectively;
- g) that both reference levels are widely recognized and used in different parts of the world,

recommends

1 that broadcasters and common carriers should uniquely use either −18 dBFS or −20 dBFS as the reference level (also designated as the alignment level (AL)) for digital audio accompanying television in international programme exchange, and they should declare their chosen reference level;

2 that, whichever reference level is chosen and used, digital audio programme peaks should not be allowed to exceed a level 9 dB below the digital full-scale level (0 dBFS²) when monitored

* Radiocommunication Study Group 6 made editorial amendments to this Recommendation in March 2023 in accordance with Resolution ITU-R 1.

¹ Decibels with respect to full-scale level.

by a quasi-peak programme meter³ as specified in International Electrotechnical Commission (IEC) 60268-10. This level is called the permitted maximum level (PML) (see Appendix 1 for a graphical representation of the recommended relations among these audio levels);

3 that consideration should be given to revising this Recommendation when practical methods of metering become available that objectively measure and indicate true peak levels and perceived loudness.

NOTE 1 – Due to the characteristics of quasi-ppm used by broadcasters, the true programme peaks may typically be 3 dB greater than those indicated, and may be even higher for some unusual short-duration transients, reaching up to 5 dB, or more, in exceptional cases.

NOTE 2 – IEC 60268-10 publication is available in electronic form at the following address: Homepage | IEC (<https://www.iec.ch/homepage>).

Appendix 1 (Informative)

Graphical representation of the recommended relation among audio levels

This Appendix offers a graphical representation of the relation among the maximum audio level (0 dBFS), the permitted maximum level as indicated by a quasi-ppm and ALs agreed by the SMPTE and EBU.

It illustrates that audio material conforming to this Recommendation may be exchanged and used without any level adjustment being required.

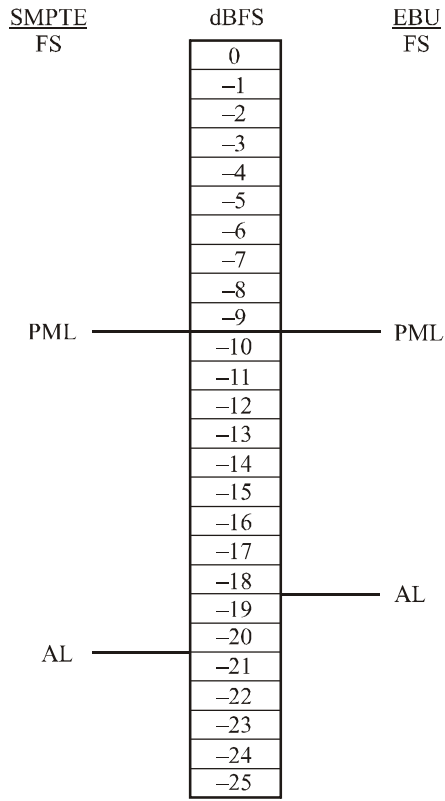
However, audio material must still be indicated as using an SMPTE RP 155 or EBU Technical Recommendation R68 alignment level in case operators or automatic equipment use steady tone at this level to line up circuits or recording devices.

² 0 dBFS is the maximum signal level that a digital audio system is capable of representing. Above this level, abrupt signal clipping occurs with the consequent distortion.

³ Quasi-peak programme meters have an integration time of 10 ms, thereby also indicating relatively short audio programme transients. True peak-reading meters will exceed this indication on some programme material, whereas VU meters will typically under-read this indication as they have a long integration time.

FIGURE 1

Graphical representation of the recommended relation among audio levels



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