RP 155-2004
Revision of RP 155-1997

SMPTE RECOMMENDED PRACTICE

for Motion Pictures and Television — Reference Level for Digital Audio Systems

1 Scope

This practice specifies the amplitude of a reference signal to be used to facilitate the interchange of digital audio signals or recordings or for the calibration of audio level indicators and other devices.

2 Specifications

2.1 The reference signal shall be the digital representation, in twos complement format, of a1000-Hz sine wave whose positive peaks attain the value 0CCD (hex) and whose negative peaks attain F333 (hex) in a 16-bit system. In a 20-bit system, the positive peaks attain the value 0CCCD (hex) and the negative peaks attain the value F3333 (hex). This is 20 dB below the full-scale signal, or system maximum, in which the positive peak attains the value 7FFF (hex) and the negative peak attains the value 8000 (hex) in a 16-bit system, or 7FFFF (hex) and 80000 (hex) respectively in a 20-bit system.

The reference signal amplitude shall be denoted –20 dBFS, indicating its relation to the full-scale signal.

2.2 Where present in a system in analog form, the reference signal shall be a 1000-Hz sinewave whose amplitude is such that the system analog-to-digital converter generates the digital representation described in clause 2.1.

2.3 Preemphasis shall not be used when recording the reference signal.

Annex A (informative)
Adjustable levels

A known reference signal level aids program interchange by providing an unambiguous method of setting either unity gain or the necessary amount of gain or loss to compensate for different operating practices used by the organizations sending and receiving the programs.

Designers of digital equipment are also urged to provide a simple method of setting input, output or system gain to unity to ensure transparent transfers.

Note that other reference levels are also in use.

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MOTION PICTURE AND TELEVISION ENGINEERS
595 W. Hartsdale Ave., White Plains, NY 10607
(914) 761-1100

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