

RECOMMENDATION ITU-R BS.646-1<sup>\*,\*\*</sup>**Source encoding for digital sound signals  
in broadcasting studios**

(1986-1992)

The ITU Radiocommunication Assembly,

*considering*

- a) that the introduction of digital techniques in the studio for broadcasting applications should improve quality as well as operational facilities;
- b) that there is a need to define a common sampling frequency for sound-programmes and for sound accompanying television programmes in studio applications;
- c) that this sampling frequency should be simply related to the 32 kHz sampling frequency recommended for transmission links, and for satellite broadcasting by the ITU-R in order to reduce the cost of transcoding equipment;
- d) that the dynamic range has to provide adequate headroom for processing and overload margin, taking into account that a dynamic range equivalent to at least 14 bits per sample resolution is recommended for some existing broadcasting applications, and a dynamic range equivalent to 16 bits per sample resolution is proposed for some future services,

*recommends*

- 1 that the sampling frequency for the digital encoding of sound signals in broadcasting studio applications including recording should have a nominal value of 48 kHz;
- 2 that the sampling frequency for the digital encoding of sound signals in television applications should have the same value;
- 3 that when an item of digital audio equipment is operating in a free-running mode, the maximum tolerance for the internal sampling frequency should be  $\pm 1 \times 10^{-5}$ . When items of digital audio equipment are interconnected, in sound broadcasting or television applications, provision must exist for locking the internal sampling frequency clocks to an external sampling frequency (e.g., television synchronizing signals, broadcasting house master clock, high-accuracy clock from a telecommunication network);
- 4 that the coding used should have a minimum resolution equivalent to 16 bits per sample uniform coding;
- 5 that where the dynamic range of the service exceeds the equivalent of 14 bits per sample resolution, a resolution of 18 bits per sample is advantageous;
- 6 that no pre-emphasis should be used.

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\* This Recommendation should be brought to the attention of Radiocommunication Study Group 6 and Telecommunication Standardization Study Group 9.

\*\* Radiocommunication Study Group 6 made editorial amendments to this Recommendation in 2002 in accordance with Resolution ITU-R 44.