

## RECOMMENDATION ITU-R BS.1596

**Guide to ITU-R Recommendations for  
broadcast sound production**

(Question ITU-R 207/10)

(2002)

The ITU Radiocommunication Assembly,

*considering*

- a) that ITU-R has issued several Recommendations on broadcast sound production;
- b) that monitoring headphones are used in many situations in broadcasting;
- c) that standardization of the electro-acoustic characteristics of monitoring headphones is desirable for consistent production quality;
- d) that the electro-acoustic characteristics of monitoring headphones vary much more widely than the electro-acoustic characteristics of monitoring loudspeakers;
- e) that multichannel sound production formats have become widely used in broadcasting due to the popularity of multichannel cinema sound systems and home theatre;
- f) that compatibility between multichannel, 2-channel and single-channel sound production formats in broadcasting is desirable for production and exchange of live and recorded programmes,

*recommends*

**1** that broadcasters should base their assessment of monitoring headphones on Recommendation ITU-R BS.708 – Determination of the electro-acoustical properties of studio monitor headphones, as summarized in Annex 1 in order to assess monitoring headphones accurately and consistently;

**2** that broadcasters should base their production of multichannel sound on Recommendations ITU-R BS.775 – Multichannel stereophonic sound system with and without accompanying picture, and ITU-R BS.1423 – Guidelines for producing multichannel soundtracks using surround matrix techniques, as summarized in Annex 1 in order to achieve consistency of results and compatibility with 2-channel and single-channel reproduction;

**3** that broadcasters should assess and select digital sound production equipment in accordance with Recommendation ITU-R BS.646 – Source encoding for digital sound signals in broadcasting studios, as summarized in Annex 1 to ensure optimal technical performance of sound production systems for broadcasting.

## ANNEX 1

**Guide to ITU-R Recommendations for  
broadcast sound production**

This Annex is intended as a guide to all of the ITU-R Recommendations in the BS series on broadcast sound production. It contains a brief description of each Recommendation and its areas of applicability.

ITU-R Recommendations are frequently updated as new technologies, practices or requirements appear. Version number suffixes of ITU-R Recommendations are therefore not appended. The most recent version of each Recommendation should always be used.

The Recommendations are treated as a single group of general Recommendations for broadcast sound production.

**General Recommendations for broadcast sound production**

Recommendation ITU-R BS.708 – Determination of the electro-acoustical properties of studio monitor headphones, contains information regarding the following:

- requirement for amplitude-frequency response;
- response deviation limits;
- methods of frequency response measurement.

This Recommendation is intended only as an aid in assessing the electro-acoustic performance of studio monitoring headphones. It does not attempt to advise on the relative merits of loudspeaker monitoring and headphone monitoring, nor on the many other aspects of importance in headphone selection such as cost, comfort, durability, repairability, feedback susceptibility, electrical impedance, electro-acoustical efficiency, consistency between units, non-linear distortion and maximum sound level.

Recommendation ITU-R BS.775 – Multichannel stereophonic sound system with and without accompanying picture, contains the following information:

- standard geometry for loudspeakers and listening position;
- specification for 5/2/5 channel encoding/transmission/decoding system which maximizes compatibility with 2-channel and single-channel systems;
- an optional listening arrangement with enhanced surround sound field coverage using three front loudspeakers and four surround loudspeakers.

This Recommendation may be used as an aid in the design and use of production areas for multichannel sound production and for listening areas for assessment and review of multichannel sound productions.

Recommendation ITU-R BS.1423 – Guidelines for producing multichannel soundtracks using surround matrix techniques, contains information regarding:

- procedures for quality checking on the matrix encode-decode operation;
- requirements for monitoring decoders;

- recommendations for preservation of source recordings and their primary (unmatrixed) recording format;
- recommendations for labelling of master recordings and copies, both within the programme and on media and/or containers.

This Recommendation is intended to outline good operating practices in multichannel sound production for broadcasting to ensure that technical production quality is maintained throughout the production process from acquisition to distribution, transmission and archiving.

Recommendation ITU-R BS.646 – Source encoding for digital sound signals in broadcasting studios, contains operating parameters and performance guidelines for analogue to digital conversion in sound equipment. It covers sample rates, converter resolution and linearity, sample clock stability and clock synchronization requirements for edit systems and picture synchronization.

This Recommendation is intended as a guide to selection and assessment of performance of digital sound production equipment and digital sound production systems for broadcasting.

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