

EBU Technical Recommendation R96-2004

Formats for production and delivery of multichannel audio programmes

<i>EBU Committee</i>	<i>First Issued</i>	<i>Revised</i>	<i>Re-issued</i>
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New broadcasting systems (DAB, DVB) and new storage media (DVD) provide the basis for the use of multichannel audio in the home. This has produced growing interest in exploiting multichannel audio technology for radio and television broadcasting.

Throughout the world, a number of different formats are used or have been proposed for multichannel audio systems. There is a need to define clearly the formats for production, recording, transmission, interchange and delivery of multichannel audio programmes for broadcasting, with or without accompanying pictures, to be used by EBU Members.

ISO/IEC and ITU-R International Standards, as well as EBU documents define a number of requirements and conditions for recording, coding, transmission and reproduction of multichannel sound in certain signal and channel formats, which are based on the so-called 3/2 plus optional LFE channel (5.1) audio format.

Special emphasis has to be given to the compatibility between multichannel audio formats and the existing two-channel audio systems used for broadcasting, and also the existing matrix-surround systems carried by two-channel transmission systems.

The EBU *recommends*:

1. That for production, recording, broadcasting and interchange of multichannel audio programmes, with or without accompanying pictures, the 3/2 format according to Recommendation ITU-R BS.775-1^[1] should be used. This format contains the signals

L	Left
R	Right
C	Centre
LS	Left surround
RS	Right surround
LFE	Low frequency effects (optional)

2. That the track allocation described in EBU Recommendation R91-2004^[2] should be used for recording multichannel audio signals.
3. That for critical subjective assessment of multichannel audio programmes in the production processes the listening conditions described in the Supplement 1 to EBU Tech 3276^[3] should be used.
4. That transmitted or recorded multichannel audio programme material should be backward compatible to existing two-channel stereophonic reproduction.
5. That compatibility should be provided if possible between the discrete 3/2 channel the system and the existing two-channel surround sound systems already widely used (for example, the Dolby Surround[®] 3/1 format).
6. That existing audio material (especially ready-made film programmes) which is only available in a multichannel format non-compatible to the 3/2 system recommended above, should be re-mixed and/or

converted (re-encoded), possibly from a source as close as possible to the uncoded original, with careful checking of the resulting quality.

7. That Members should exploit additional features of multichannel transmission systems such as Dynamic Range Control (DRC) or multilingual services for the benefit of the listeners.

Bibliography

- [1] ITU-R Recommendation BS.775-1 (1994): **Multi-channel stereophonic sound system with and without accompanying picture**
 - [2] EBU Recommendation R91-2004: **Track allocations and recording levels for the exchange of multichannel audio signals**
 - [3] EBU document Tech. 3276, Supplement 1: **Listening conditions for the assessment of sound programme material: multichannel**
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