



**Recommendation ITU-R BR.1684**  
(09/2004)

**Recording of 5.1-channel audio  
programmes on video  
tape recorders**

**BR Series**  
**Recording for production, archival and  
play-out; film for television**

## Foreword

The role of the Radiocommunication Sector is to ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services, including satellite services, and carry out studies without limit of frequency range on the basis of which Recommendations are adopted.

The regulatory and policy functions of the Radiocommunication Sector are performed by World and Regional Radiocommunication Conferences and Radiocommunication Assemblies supported by Study Groups.

## Policy on Intellectual Property Right (IPR)

ITU-R policy on IPR is described in the Common Patent Policy for ITU-T/ITU-R/ISO/IEC referenced in Annex 1 of Resolution ITU-R 1. Forms to be used for the submission of patent statements and licensing declarations by patent holders are available from <http://www.itu.int/ITU-R/go/patents/en> where the Guidelines for Implementation of the Common Patent Policy for ITU-T/ITU-R/ISO/IEC and the ITU-R patent information database can also be found.

### Series of ITU-R Recommendations

(Also available online at <http://www.itu.int/publ/R-REC/en>)

Series	Title
BO	Satellite delivery
<b>BR</b>	<b>Recording for production, archival and play-out; film for television</b>
BS	Broadcasting service (sound)
BT	Broadcasting service (television)
F	Fixed service
M	Mobile, radiodetermination, amateur and related satellite services
P	Radiowave propagation
RA	Radio astronomy
RS	Remote sensing systems
S	Fixed-satellite service
SA	Space applications and meteorology
SF	Frequency sharing and coordination between fixed-satellite and fixed service systems
SM	Spectrum management
SNG	Satellite news gathering
TF	Time signals and frequency standards emissions
V	Vocabulary and related subjects

*Note: This ITU-R Recommendation was approved in English under the procedure detailed in Resolution ITU-R 1.*

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## RECOMMENDATION ITU-R BR.1684\*

**Recording of 5.1-channel audio programmes on video tape recorders**

(Question ITU-R 58/6)

(2004)

**Scope**

This Recommendation provides guidance on the mapping of 5.1 audio signals onto the tracks of a recording device. Further detailed mappings for a complete set of audio signals are provided by Recommendation ITU-R BR.1384.

The ITU Radiocommunication Assembly,

*considering*

- a) that Recommendation ITU-R BS.775-1 – Multichannel stereophonic sound system with and without accompanying picture, specifies a five-channel audio system with an additional channel designated for low-frequency effects (5.1-channel audio);
- b) that Recommendation ITU-R BR.1384 – Parameters for international exchange of multichannel sound recordings, specifies track assignments for 5.1-channel audio;
- c) that Recommendation ITU-R BS.1548-1 – User requirements for audio coding systems for digital broadcasting, specifies user requirements for contribution and distribution and further contains information on systems that have been shown to meet the listed requirements;
- d) that many broadcasters worldwide are providing television services that include multichannel sound by means of terrestrial, and satellite emission and secondary distribution via cable;
- e) that the recording of multichannel sound programmes for production and distribution for both standard-definition television and high-definition television is now well advanced and that their international exchange for broadcast purposes is increasing;
- f) that specifications for preferred methods of recording multichannel audio on video tape recorders are needed to avoid operational problems and to facilitate the interchange of recordings,

*recommends*

**1** that when recording 5.1-channel audio programmes on VTRs that can directly record at least six channels of PCM audio, the track assignment, recording characteristics and level alignment should be in accordance with Recommendation ITU-R BR.1384;

**2** that when employing bit-rate reduction to allow the recording of 5.1-channel audio programmes on video tape recorders (VTRs) that can directly record four channels of PCM audio for the purposes of contribution and distribution:

- a two-channel stereo compatible version of the programme should be recorded on tracks 1 and 2, with the left channel on track 1 and the right channel on track 2;

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\* Radiocommunication Study Group 6 made editorial amendments to this Recommendation in November 2009 in accordance with Resolution ITU-R 1.

- the 5.1-channel audio programme should be encoded by a low bit-rate audio coding system that reduces the data rate to a value that can be recorded in an AES3 channel pair on the VTR;
- the audio coding system employed should meet the requirements for contribution and distribution listed in Annex 1 of Recommendation ITU-R BS.1548<sup>1</sup>;
- the low bit-rate encoded audio to be fitted into an AES3 compatible data stream may be formatted per SMPTE 337-2008;
- the track assignment, recording characteristics and level alignment at the interfaces into and out of the audio coding system should be in accordance with Recommendation ITU-R BR.1384;
- the low bit-rate encoded audio data stream should be recorded on tracks 3 and 4 of the VTR.

NOTE 1 – SMPTE Standard 337-2008 is given in Annex 1 and is also available in electronic form at the ITU website: <http://www.itu.int/ITU-R/index.asp?category=study-groups&rlink=itu-smpte&lang=E>. SMPTE Standard 337-2008 refers to version 2008 only, which is the version approved, by administrations of Member States of the ITU and Radiocommunication Sector Members participating in the work of Radiocommunication Study Group 6 in application of Resolution ITU-R 1-3. By agreement between ITU and SMPTE, this version was provided and authorized for use by SMPTE and accepted by ITU-R for inclusion in this Recommendation. Any subsequent version of SMPTE Standard 337, which has not been accepted and approved by Radiocommunication Study Group 6 is not part of this Recommendation. For subsequent versions of SMPTE documents, the reader should access the SMPTE website: <http://www.smpete.org>.

## Annex 1

[SMPTE Standard 337-2008](#).

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<sup>1</sup> Recommendation ITU-R BS.1548 specifies that, for an audio coding system employed for contribution and distribution:

“The quality of sound reproduced after a reference contribution/distribution cascade (five contribution codecs and three distribution codecs working consecutively) should be subjectively indistinguishable from the source for most types of audio programme material. Using the triple stimuli double blind with hidden reference test, described in Recommendation ITU-R BS.1116 – Methods for the subjective assessment of small impairments in audio systems including multichannel sound systems – requires mean scores generally higher than 4.5 in the impairment 5-grade scale, for listeners at the reference listening position. The worst rated item should not be graded lower than 4 (Recommendation ITU-R BS.775).”