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Radiocommunication Sector of ITU

Recommendation ITU-R BS.1738-1
(10/2015)

Identification and ordering of 4 and 8 track audio channels carried on international contribution circuits

BS Series

Broadcasting service (sound)

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SNG	Satellite news gathering
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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 BS.1738-1*

Identification and ordering of 4 and 8 track audio channels carried on international contribution circuits

(2007-2015)

Scope

This Recommendation provides the means to identify the allocation of multiple audio signals on international contribution circuits as well as the preferred ordering of these signals.

Keywords

Channel ordering, multiple channel audio, channel allocation

The ITU Radiocommunication Assembly,

considering

a) that the exchange of television programmes is very important and extensive;

b) that there is a requirement to transmit more than one sound signal including stereophony with a television picture;

c) that within a television channel as used in present systems several sound channels could be accommodated;

d) that Recommendation ITU-R BS.1726 – Signal level of digital audio accompanying television in international programme exchange recommends reference level and permitted maximum level (PML) of digital audio signal for international programme exchange;

e) that international identification of media content and of the format used for programme exchange offers both economical and operational advantages;

f) that an alignment of operational practices used in connection with the identification of the content and format of sound programmes is highly desirable;

g) that a technique is applied where simultaneous availability of a line-up tone on the channels present in stereo and multi-channel modes so that the phase relationship between channels can be checked to mitigate a 180° phase reversal;

h) that transmission systems with bit-rate reduced coding for multichannel sound transmission are in use in several countries;

i) that production scenarios increasingly involve eight audio channels for 5.1 surround sound;

j) that coding of multi-track sound into an audio multiplex for audio production in many programme genres is increasing as a requirement for international programme exchange for sound and television broadcasting;

k) that specifications for international exchange of programmes with multiple channel audio is subject to contractual and commercials arrangements among the broadcasters and programme rights holders;

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* Radiocommunication Study Group 6 made editorial amendments to this Recommendation in the year 2016 and in March 2023 in accordance with Resolution ITU-R 1.

m)   that many administrations are becoming increasingly involved in the exchange of television programme material,

   recommends

1   that, if audio channel identification is required or in use, then the signalling should at least provide minimum information to ensure that downstream of the source any user can unambiguously determine the channel number and thus the content;

2   that the reference signal of each channel in a stereo signal should be a 1 000 Hz alignment tone at the reference level of either –18 dB FS or –20 dB FS in accordance with Recommendation ITU-R BS.1726, interrupted at least once every 30 s by a voice announcement indicating the channel number and optionally the source name;

3   that in stereo and multi-channel contribution circuits the reference tone should be applied simultaneously to all channels to aid in confirming correct phase relationship between channels at the destination end;

4   that the use of the channels to carry the various audio components of the programme should be mutually agreed in advance among the parties concerned;

5   that in the absence of such advance agreement, the use of channels indicated in Annexes 1, 2 and 3 should be preferred for the production scenarios described in it;

6   that Annexes 1, 2 and 3 should be extended, when required, to reflect other scenarios.

Annex 1

Identification and ordering of four track audio channels carried on international contribution circuits

This Annex describes preferred identification of audio channels for production scenarios for stereophonic or monophonic sound programs using four audio channels in the absence of advanced mutual agreement among the parties concerned.

Production scenario 1

This scenario is the one in which the commentator of the destination broadcaster is located at the destination broadcaster's facility. In this case the destination broadcaster will often translate the host guide commentary from the host language and make a new mix of local commentary with international sound. Two instances are considered in Table 1, namely, stereophonic or monophonic sound.

TABLE 1

Channel number	Stereo audio signal	Monophonic audio signal
1	International sound (stereo effects – L_t)	International sound (mono)
2	International sound (stereo effects – R_t)	International sound (mono)
3	Guide commentary (stereo – L_t)	Guide commentary (mono)
4	Guide commentary (stereo – R_t)	Guide commentary (mono)

–	International Sound = Music + Effects + Interview Dialogue

–	Guide Commentary Stereo, Host Language as L_t/R_t = Music + Effects + Dialogue

–	Interview dialogue is voice signals during interviews between host broadcast commentators and interviewees. Guide commentary is provided by the host broadcaster for the purpose of guidance for those providing commentary at the destination(s).

NOTE 1 – In situations where monophonic sound or guide commentary is required it is recommended that both channels carry the same monophonic audio as shown in Table 1 to avoid operation confusion.

NOTE 2 – In this Recommendation, the terms L_t, and R_t are used only to differentiate these channels of a stereo signal from the front left and front right channels of a surround sound program. In other contexts, the terms L_t, R_t, L_o, and R_o, are used to denote downmixes of a surround sound signal wherein the left surround and right surround channels have been combined with the front left and front right channels. In those contexts, L_t and R_t denote a "matrix encoded surround mix" in which the surround signals have been summed, and the sum added to the front left and front right channels, with 90° and –90° phase shifts respectively. This creates a pair of signals that can be decoded to recreate a surround experience.

L_o and R_o (not used in this Recommendation) denote a downmix in which the left surround channel is added to the left front channel, the right surround signal is added to the front right channel, without a phase shift being applied to either.

In both cases the centre channel signal is also added to front left and front right. In both cases, the signals that are added to front left and front right are, in general, attenuated before they are added. The amount of attenuation for L_t and R_t is 3 dB, but for L_o and R_o may be chosen to suit the nature of the programme material. In this Recommendation, there is no implication of the nature of the stereo channels.

Production scenario 2

This scenario is the one in which the destination broadcaster has a commentator located at the host broadcaster's facility and this commentary is mixed with international sound in the destination facility.

TABLE 2

Channel number	Stereophonic audio signal	Monophonic audio signal
1	Left channel international sound	International sound (Mono)
2	Right channel international sound	International sound (Mono)
3	Mono dialogue – destination language	Commentary or mono dialogue
4	User defined/cue channel/mono dialogue host dialogue	User defined/cue channel/mono dialogue host dialogue

International Sound = Music + Effects + Interview Dialogue

Production scenario 3

This scenario is the one in which the destination broadcaster has a commentator located at the host broadcaster's facility and this commentary is mixed with international sound at the host facility.

TABLE 3

Channel number	Stereophonic audio signal	Monophonic audio signal
1	Left channel, complete mix	Complete monophonic mix
2	Right channel, complete mix	Complete monophonic mix
3	Left channel international sound	International sound (mono)
4	Right channel international sound	International sound (mono)

Annex 2

Identification and ordering of eight track audio channels carried on international contribution circuits

This Annex describes preferred identification of audio channels for production scenarios for 5.1 surround sound programs using eight audio channels in the absence of advanced mutual agreement among the parties concerned.

Production scenario 4

This scenario involves the international exchange of programs using 5.1 audio in which the outbound circuits from the broadcaster include a fully integrate stream of programs, commercials, and promotions.

TABLE 4

Channel number	5.1 Surround sound audio signal
1	Left channel, complete mix
2	Right channel, complete mix
3	Centre channel, complete mix
4	Low frequency effects
5	Left surround channel
6	Right surround channel
7	Optional secondary audio program channel
8	Optional video description channel

Production scenario 5

This scenario involves production using 5.1 audio in which the destination broadcaster has a commentator located at the host broadcaster's facility and this commentary is mixed at the host facility.

TABLE 5

Channel number	5.1 Surround sound audio signal
1	Left channel, complete mix
2	Right channel, complete mix
3	Centre channel, complete mix
4	Low frequency effects
5	Left surround channel
6	Right surround channel
7	Optional left channel international sound
8	Optional right channel international sound

Production scenario 6

This scenario involves a production using both a stereo complete mix on channels 1 and 2, and a 5.1 surround sound complete mix on channels 3 to 8.

TABLE 6

Channel number	Stereo and 5.1 surround sound audio signals
1	Stereo left channel, complete mix
2	Stereo right channel, complete mix
3	5.1 Left channel, complete mix
4	5.1 Right channel, complete mix
5	5.1 Centre channel, complete mix
6	5.1 Low frequency effects channel, complete mix
7	5.1 Left surround channel, complete mix
8	5.1 Right surround channel, complete mix

Production scenario 7

This scenario involves production using both a 5.1 surround sound complete mix on channels 1 to 6 and a stereo complete mix on channels 7 and 8.

TABLE 7

Channel number	5.1 surround sound and stereo audio signals
1	5.1 Left channel, complete mix
2	5.1 Right channel, complete mix
3	5.1 Centre channel, complete mix
4	5.1 Low frequency effects channel, complete mix
5	5.1 Left surround channel, complete mix
6	5.1 Right surround channel, complete mix
7	Stereo left channel, complete mix
8	Stereo right channel, complete mix

Annex 3

**Identification and ordering of audio signal content
using digital audio multiplexes**

This Annex describes the preferred identification and ordering of audio signal content using digital audio multiplexes in the absence of advanced mutual agreement among the parties concerned.

Production scenario 8

This scenario is possible when the Host broadcaster can provide a multichannel mix (typically 5.1) and this is required by the Destination broadcaster. The centre channel of the multichannel mix may be either in the Host or Destination language. If it is in the Host language then the defined primary contents of contribution channels 3 and 4 are necessary to enable the Destination broadcaster to create a new centre channel for its transmission. Depending on the type of Audio Multiplex used, there may be a relative timing issue with respect to vision which will need to be corrected when the new centre channel is created.

TABLE 8

Channel number	Data/audio signal content
1	Digital audio multiplex
2	Digital audio multiplex
3	Mono dialogue – Destination language or user defined
4	Mono interview dialogue or user defined

The internal contents of the digital audio multiplex should have its channels ordered as per Tables 4 and 5 above.

Production scenario 9

For broadcasters who are concerned about possible stability issues of the compressed audio data of a multiplex on satellite or fibre-optic contribution circuits, this scenario may be used.

TABLE 9

Channel number	Data/audio signal content
1	Left channel, complete mix or international sound
2	Right channel, complete mix or international sound
3	Digital audio multiplex
4	Digital audio multiplex

Channels 7 and 8 of the audio multiplex may carry the additional audio information necessary when the host and destination languages are different.