

International Telecommunication Union

ITU-R
Radiocommunication Sector of ITU

Recommendation ITU-R BT.2023
(08/2012)

**Performance requirements for the
production, international exchange
and broadcasting of 3DTV programmes**

BT Series
Broadcasting service
(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
BR	Recording for production, archival and play-out; film for television
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.

Electronic Publication
Geneva, 2012

© ITU 2012

All rights reserved. No part of this publication may be reproduced, by any means whatsoever, without written permission of ITU.

RECOMMENDATION ITU-R BT.2023

Performance requirements for the production, international exchange and broadcasting of 3DTV programmes

(2012)

Scope

This Recommendation specifies the performance requirements and criteria that should be used worldwide for the production, international exchange and broadcasting of stereoscopic 3DTV¹ programmes. This Recommendation includes references to some of the production requirements necessary to achieve a comfortable, high quality 3DTV viewing experience.

The ITU Radiocommunication Assembly,

considering

- a) that since programme producers and broadcasters are producing 3DTV programmes for domestic broadcasting and for international programme exchange using existing ITU-R monoscopic Recommendations contained in the current standards, there is a need to develop a set of ITU-R Recommendations to be used worldwide in the production of 3DTV programmes for broadcasting, to facilitate their international exchange;
- b) that 3DTV broadcasters, programme producers and distributors often need to preserve the value and quality of their programmes for television broadcast use and therefore they have an interest in protecting their programmes from technical obsolescence;
- c) that a 3DTV audience with normal binocular² vision expects to have a comfortable viewing experience for the duration of the programme;
- d) that visual comfort and quality of 3DTV images is influenced by ranges of parallax distributions, as well as other factors including programme production techniques, display devices, 3D glasses and viewing conditions;
- e) that the overall performance requirements for a 3DTV system need to be identified in sufficient detail in order to orient the choice of the appropriate technologies for its implementation;
- f) that 3DTV programmes need to be converted to monoscopic TV with a quality adequate for distribution,

noting

- a) that television image processing techniques have developed to the point where the technical solutions applicable to the video signal in the production of 3DTV television programmes for international exchange do not need to necessarily coincide with the solutions applicable to the broadcast emission of 3DTV television programmes to a television audience;
- b) that 3DTV presently requires two separate views of the same subject: the Left eye (Le) and Right eye (Re), and that once captured, they must be processed, carried and stored in such a way that no errors are introduced that might affect one signal more than, or differently from the other, including the relative timing of the two signals,

¹ In the context of this Recommendation, the term 3DTV is used to convey a stereoscopic image or image pair.

² Binocular vision can vary depending on the physical characteristics of individual viewers.

recommends

1 that the performance requirements and criteria listed in Annex 1 should be taken into account when determining the appropriate technologies for a 3DTV system for production, international programme exchange and broadcasting.

NOTE – The list of performance requirements and criteria in Annex 1, albeit quite comprehensive, should be reviewed and possibly extended as necessary to reflect technological progress, improved knowledge of human visual perception and audience preferences concerning implementations of 3DTV presentations.

Annex 1

Performance requirements for the production, international exchange and broadcasting of 3DTV programmes

The performance requirements and criteria listed below should be taken into account when determining the appropriate technologies for a 3DTV broadcasting system.

1 The viewing experience provided by a 3DTV broadcasting service should be at least equal to, and preferably represent an improvement over, the experience provided by full-quality monoscopic broadcasting without being inferior to it in any aspect.

2 The use of existing technical solutions should be encouraged where feasible, when identifying optimal specifications for a 3DTV television programme production and broadcasting system based on existing ITU-R Recommendations.

3 For the production of 3DTV television programmes for international exchange:

- it is desirable that there is a single set of image and sound specifications for each ITU-R television system used for the production of 3DTV television programmes for international exchange;
- it is important for broadcasters, programme producers and distributors to use audio and video systems selected among those that provide the best technical and perceptual sound and picture quality, thus preserving the value and technical quality of their programmes in view of their future re-use;
- it would be beneficial if programmes produced for 3DTV television broadcasting could be easily adapted for broadcasting as monoscopic programmes without a loss other than depth information, at a technical quality adequate to those forms of distribution.

4 For the broadcasting of 3DTV television programmes to the general public:

- a certain degree of backward interoperability of a new 3DTV broadcasting service with existing digital television broadcasting services should desirably be preserved³;

³ This is likely to be the overriding consideration in the initial phase of introduction of a 3DTV television broadcasting service.

- in the current scarcity of broadcast spectrum, the source coding and the channel coding used for the emission of a 3DTV television broadcasting system should make efficient use of channel capacity and spectrum, with the aim to accommodate the highest possible quality 3DTV broadcasting service within the emission bandwidths and channel capacity currently allocated to terrestrial and satellite broadcasting services;
 - in the case of a 3DTV broadcasting system that is intended to allow for the compatible reception of monoscopic signals, the additional signal coding required to convey the extra information needed for 3DTV should as far as possible, cause no perceivable degradation to the monoscopic television presentation.
-