

International Telecommunication Union

**ITU-R**  
Radiocommunication Sector of ITU

**Recommendation ITU-R BT.2024-0**  
(08/2012)

**HDTV digital image systems for the  
production and international exchange of  
3DTV programmes for broadcasting**

**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.

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### Series of ITU-R Recommendations

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

Series	Title
<b>BO</b>	Satellite delivery
<b>BR</b>	Recording for production, archival and play-out; film for television
<b>BS</b>	Broadcasting service (sound)
<b>BT</b>	<b>Broadcasting service (television)</b>
<b>F</b>	Fixed service
<b>M</b>	Mobile, radiodetermination, amateur and related satellite services
<b>P</b>	Radiowave propagation
<b>RA</b>	Radio astronomy
<b>RS</b>	Remote sensing systems
<b>S</b>	Fixed-satellite service
<b>SA</b>	Space applications and meteorology
<b>SF</b>	Frequency sharing and coordination between fixed-satellite and fixed service systems
<b>SM</b>	Spectrum management
<b>SNG</b>	Satellite news gathering
<b>TF</b>	Time signals and frequency standards emissions
<b>V</b>	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 BT.2024-0\*

**HDTV digital image systems for the production<sup>1</sup> and international exchange of 3DTV<sup>2</sup> programmes for broadcasting**

(2012)

**Scope**

This Recommendation specifies the digital image systems that should be used worldwide for the production and international exchange of 3DTV programmes for broadcasting.

This Recommendation does not define image acquisition parameters such as camera shutter angle or camera image synchronization.

**Keywords**

3DTV, broadcasting, digital image systems, programmes

The ITU Radiocommunication Assembly,

*considering*

- a) that since programme producers and broadcasters are producing 3DTV programmes for domestic broadcasting and for international programme exchange, there is a need to develop a set of ITU-R Recommendations to be used worldwide in the production of 3DTV programmes for broadcasting, in order to facilitate their international exchange;
- b) that 3DTV broadcasters, programme producers and distributors 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, consequently, the 3DTV image systems to be used worldwide, now and in the foreseeable future, for the production and international exchange of 3DTV programmes for broadcasting should provide the best technical and perceptual picture quality that current systems already widely implemented in the world can achieve;
- d) that the  $1\,920 \times 1\,080$  HDTV systems specified in Recommendation ITU-R BT.709 – Parameter values for the HDTV standards for production and international programme exchange are the television imaging systems that provide the highest picture quality,

*recommends*

**1** that, for the production and international exchange of 3DTV programmes, the  $1\,920 \times 1\,080$  HDTV systems specified in Recommendation ITU-R BT.709 should be used<sup>3</sup>;

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\* Radiocommunication Study Group 6 made editorial amendments to this Recommendation in the year 2018 in accordance with Resolution ITU-R 1.

<sup>1</sup> This Recommendation uses the term “production” in the same way as Recommendation ITU-R BT.1662, which indicates that the production section of the total television broadcasting chain includes the functions of acquisition and post-production and ends with the finished programme master.

<sup>2</sup> In the context of this Recommendation, the term 3DTV is used to convey a stereoscopic image or image pair.

<sup>3</sup> The 60/P and 50/P HDTV systems will ultimately be used for this purpose.

- 2 that the sampling lattice normally used for the 3DTV programme master for broadcasting should be 4:2:2, and the sampling lattice of 4:4:4 (R.G.B.) may be used during the production process involving complex processing;
- 3 that the preferred bit depth used for 3DTV should be 10 bits/sample<sup>4</sup>;
- 4 that the Le and Re images<sup>5</sup> of a 3DTV image pair should be internationally exchanged as two full-resolution  $1\,920 \times 1\,080$  images having the same pixel structure and picture repetition rate<sup>6</sup>;
- 5 that the relative timing between the Le and Re images at the point of exchange needs to be sufficiently accurate to allow downstream devices to resynchronize the frames for display;
- 6 that the choice of the image parameter values among those specified in this Recommendation should be included in the metadata that accompanies the images.

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<sup>4</sup> In some cases, 8 bits may be used.

<sup>5</sup> Le and Re are abbreviations for Left eye, and Right eye, respectively.

<sup>6</sup> In some particular circumstances, a broadcaster may choose to depart from the provisions in this *recommends*.