



Recommendation ITU-R BT.2144-0
(05/2022)

**Guidance for the introduction of new DTTB
systems, technologies and applications
in the broadcasting service**

BT Series
Broadcasting service (television)



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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 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.

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RECOMMENDATION ITU-R BT.2144-0

**Guidance for the introduction of new DTTB systems,
technologies and applications in the broadcasting service**

(2022)

Scope

This Recommendation provides guidance for the introduction of new Digital Terrestrial Television Broadcasting (DTTB) systems, technologies and applications in the broadcasting service. An appropriate method may be chosen depending on the requirements and situations in a country or region.

Keywords

Digital Terrestrial Television Broadcasting, introduction of new systems

Abbreviations/Glossary

Acronym	Definition
C/N	Carrier-to-noise ratio
DTTB	Digital terrestrial television broadcasting
FDM	Frequency-division multiplexing
HDTV	High-definition television
IBB	Integrated broadcast-broadband
LDM	Layered-division multiplexing
MFN	Multi-frequency network
MIMO	Multiple-input multiple-output
MPEG	Moving pictures expert group
PMSE	Programme making- and special events
PSM	Public service media
QoS	Quality of service
SDM	Space division multiplexing
SDTV	Standard definition television
SFN	Single-frequency network
SISO	Single-input single-output
TDM	Time-division multiplexing
UHDTV	Ultra-high definition television

Related ITU Recommendations, Reports

Recommendation ITU-R BT.1877 – Error-correction, data framing, modulation and emission methods and selection guidance for second generation digital terrestrial television broadcasting systems

Report ITU-R BT.2400 – Usage scenarios, requirements and technical elements of a global platform for the broadcasting service

Report ITU-R BT.2485 – Advanced network planning and transmission methods for enhancements of digital terrestrial television broadcasting

The ITU Radiocommunication Assembly,

considering

- a) that a long time has passed since the world first launched terrestrial digital television services and that the transition from analogue to digital television broadcasting globally has either been completed or is currently underway;
- b) that new systems, technologies, and applications for broadcasting aim to deliver television, sound and multimedia programmes more efficiently and to provide the audience with new audio-visual experiences;
- c) that a crucial issue is how best such new systems, technologies and applications can be introduced in the broadcasting service where the first generation of DTTB systems are in operation, without giving adverse effects to the audience;
- d) that it is also important to consider methods that can ensure continuous advancements of broadcasting in the future;
- e) that several scenarios may be possible in terms of timelines of the process, parties involved and public policies to drive transitions,

recognizing

- a) that Resolution ITU-R 70 resolves to develop Recommendations and Reports for the introduction of new systems, technologies and applications for broadcasting to achieve global harmonization of specifications;
- b) that Resolution ITU-R 71 resolves that a roadmap for ITU-R activities for broadcasting should be developed by the relevant Radiocommunication Study Group to ensure that this work is progressed effectively and efficiently;
- c) that Recommendation ITU-R BT.1877 specifies second generation digital terrestrial television broadcasting systems,

recommends

that the guidance provided in the Annex should be considered for the introduction of new DTTB systems, technologies and applications in the broadcasting service.

Annex

Guidance for the introduction of new DTTB systems, technologies and applications in the broadcasting service

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1 Introduction

Over 20 years have passed since the world's first launch of DTTB. With the advent of new systems, technologies and applications for broadcasting that aim at delivering television, sound and multimedia programmes more efficiently and providing the audience with new audio-visual experiences, a crucial issue is how best such new systems, technologies and applications can be introduced in the broadcasting service where the first generation of DTTB systems are in operation, without giving adverse effects to the audience. It is also important to consider methods that can ensure the continuous advancement of broadcasting in the future.

Several scenarios may be possible in terms of timelines of the process, parties involved and public policies to drive transitions.

2 Requirements for the implementation of new DTTB systems, technologies and applications

Each country and region may have different requirements for introducing a new system due to different situations in the usage of the frequency band allocated to broadcasting, e.g. the number of channels used and unused and the intended new services and applications that may have different transmission capacity requirements, and different transmission systems and technologies adopted in the existing broadcasting service (e.g. DTTB Systems A, B, C and D; video source coding of MPEG-2, MPEG-4; video formats of SDTV and HDTV; sound formats of stereo and 5.1 multichannel).

In general, the requirements that need to be specified for the implementation of new digital terrestrial broadcasting systems, technologies and applications can be grouped into three parts: receiver-related requirements, service-related requirements and spectrum-related requirements.

To be generally accepted, any new digital terrestrial broadcasting system should fulfil the requirements of both Public Service Media (PSM) and Commercial Broadcasters.

The general requirements for broadcasters are:

- The ability to provide content free-to-air (no additional cost for viewers/listeners).
- Delivery of the content to the public without blocking or filtering the service offer, i.e. no gatekeeping.
- Content and service integrity: no modification of the content or service by third parties. For example, television content and additional services (e.g. subtitles, IBB applications, etc.) must be displayed on the screen, unaltered and without unauthorized overlays.
- Quality of service (QoS) is to be defined by the broadcaster, including the availability of a network, its robustness, up-time and reliability.
- QoS for each user shall be independent of the size of the audience.
- The broadcasting service shall not be subject to discrimination compared to equivalent services.
- Geographical availability of the service (e.g. national, regional, local) is to be defined by the broadcaster.
- A distribution network needs to support at least a minimum service offer (e.g. a minimum number of programmes) as defined by the broadcaster. These services should be available concurrently to all users within designated geographical areas.
- Ease of use: straightforward accessibility and prominence of the broadcasting offer.
- Low barrier for access to broadcasting content and services for people with disabilities (e.g. subtitles, audio description and signing).