



# LIST OF RECOMMENDATIONS

## ITU-R



# LIST OF ITU-R RECOMMENDATIONS

Edition 2003

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### NOTE

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**The bookshop is open at the ITU headquarters (Tower Building) in Geneva  
from 8h30 to 12h00 and from 13h30 to 17h00.**

# INTRODUCTION

Dear Customer,

ITU-R Recommendations constitute a set of recommended technical and operating standards for radiocommunications, previously known as CCIR Recommendations. They are the result of studies undertaken by Radiocommunication Study Groups on:

- the use of the radio-frequency spectrum in terrestrial and space radiocommunications, including the use of satellite orbits;
- the characteristics and performance of radio systems (except the interconnection of radio systems in public communication networks and the performance required for these interconnections, which are included in ITU-T Recommendations);
- the operation of radio stations; and,
- the radiocommunication aspects of distress and safety matters.

The ITU-R Recommendations are approved by ITU Member States. Their implementation is not mandatory; however, as they are developed by experts from administrations, operators, the industry and other organizations dealing with radiocommunication matters from all over the world, they enjoy a high reputation and are implemented worldwide.

ITU-R Recommendations are divided into Series according to the subjects they cover, as follows:

<b>Series</b>	<b>Subject</b>
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
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

The ITU-R Recommendations are published in Volumes and Supplements. The Volumes are published every four years and they contain all of the ITU-R Recommendations in force at that time. The Supplements are published at shorter intervals, normally once a year, and they contain only new or revised Recommendations which have been approved since the last Volume/Supplement was published.

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\* The BS and BT Series are published together in one Volume (BS and BT Series – Broadcasting service).

The ITU-R Recommendations in force are available in the following Series Volumes or Supplements:

- **2000 Series Volumes** – All ITU-R Recommendations in force following the Radiocommunication Assembly (Istanbul 2000) (RA-2000); and,
- **Supplements to the 2000 Series Volumes** – New and revised Recommendations approved after the RA-2000.

In some cases specific Recommendations have also been published separately.

All ITU-R Recommendations are available in English, French and Spanish. In addition, within established ITU budgets, there is provision for translation of a number of ITU-R Recommendations into Arabic, Chinese and Russian. The choice of which Recommendations are translated is established in collaboration with the principal ITU Member States involved. Readers interested in such language versions should get in touch with the ITU Sales and Marketing Service at the address provided in this List.

As well as being available in printed format, all of the ITU-R Recommendations in force are now accessible online, and can be downloaded via the ITU World Wide Web server at **[www.itu.int](http://www.itu.int)**. They are available in both WinWord™ 7.0 and 9.0 and Adobe Acrobat™ PDF file formats.

Two online services are provided:

- **ITU-R Recommendations Online** – where payment of an annual subscription allows the customer to download any or all of the ITU-R Recommendations; and
- **ITU Electronic Bookshop** – where individual Recommendations can be downloaded and paid for by credit card or charged to an account.

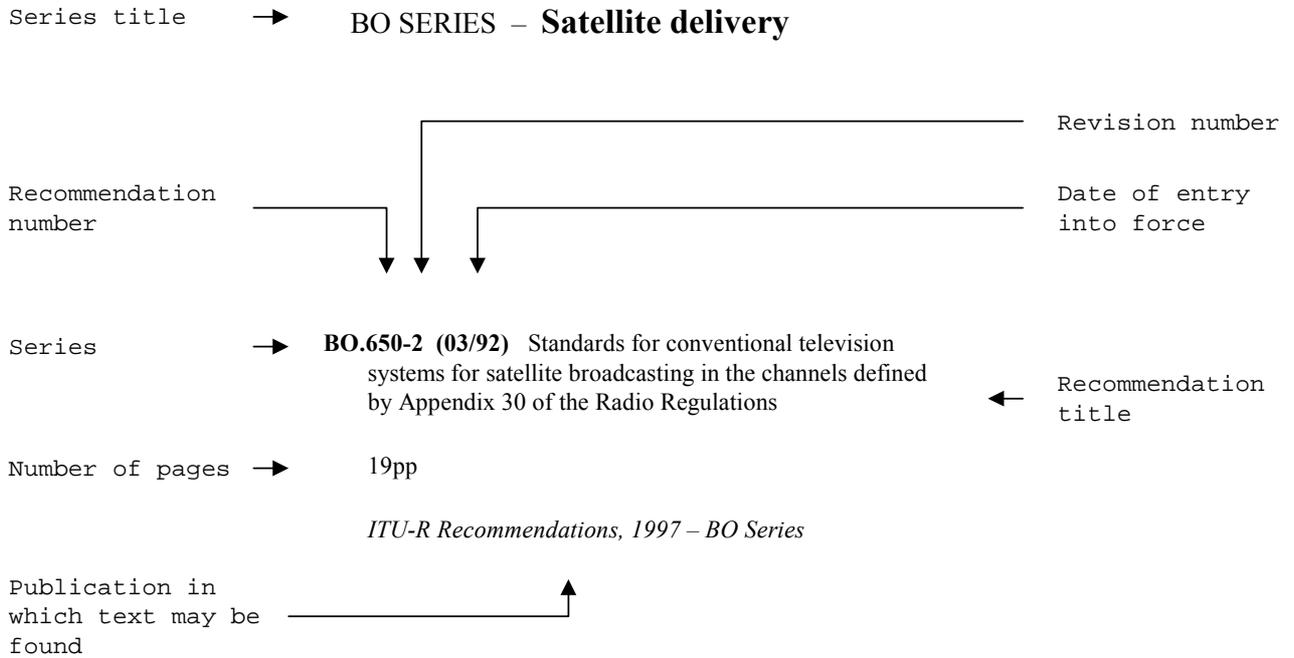
A **CD-ROM** of all ITU-R Recommendations is published in March and September every year.

The Editor

The List of ITU-R Recommendations is published annually and is kept continuously up to date on the ITU World Wide Web server

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# LEGEND





# LIST OF ITU-R RECOMMENDATIONS IN FORCE

## BO SERIES – Satellite delivery

**BO.600-1 (07/86)** Standardized set of test conditions and measurement procedures for the subjective and objective determination of protection ratios for television in the terrestrial broadcasting and the broadcasting-satellite services

*5pp*

*ITU-R Recommendations, Volume 2000 – BO Series*

**BO.650-2 (03/92)** Standards for conventional television systems for satellite broadcasting in the channels defined by Appendix 30 of the Radio Regulations

*22pp*

*ITU-R Recommendations, Volume 2000 – BO Series*

**BO.651 (07/86)** Digital PCM coding for the emission of high-quality sound signals in satellite broadcasting (15 kHz nominal bandwidth)

*2pp*

**BO.652-1 (03/92)** Reference patterns for earth-station and satellite antennas for the broadcastingsatellite service in the 12 GHz band and for the associated feeder links in the 14 GHz and 17 GHz bands

*18pp*

*ITU-R Recommendations, Volume 2000 – BO Series*

**BO.712-1 (03/92)** High-quality sound/data standards for the broadcasting-satellite service in the 12 GHz band

*53pp*

*ITU-R Recommendations, Volume 2000 – BO Series*

**BO.786 (03/92)** MUSE system for HDTV broadcasting-satellite services

*20pp*

*ITU-R Recommendations, Volume 2000 – BO Series*

**BO.787 (03/92)** MAC/packet based system for HDTV broadcasting-satellite services

*22pp*

*ITU-R Recommendations, Volume 2000 – BO Series*

**BO.788-1 (08/94)** Coding rate for virtually transparent studio quality HDTV emissions in the broadcasting-satellite service

*5pp*

*ITU-R Recommendations, Volume 2000 – BO Series*

**BO.789-2 (10/95)** Service for digital sound broadcasting to vehicular portable and fixed receivers for broadcasting-satellite service (sound) in the frequency range 1 400-2 700 MHz

*2pp*

*ITU-R Recommendations, Volume 2000 – BO Series*

**BO.790 (03/92)** Characteristics of receiving equipment and calculation of receiver figure-of-merit (G/T) for the broadcasting-satellite service

*4pp*

*ITU-R Recommendations, Volume 2000 – BO Series*

**BO.791 (03/92)** Choice of polarization for the broadcasting-satellite service

*9pp*

*ITU-R Recommendations, Volume 2000 – BO Series*

**BO.792 (03/92)** Interference protection ratios for the broadcasting-satellite service (television) in the 12 GHz band

*6pp*

*ITU-R Recommendations, Volume 2000 – BO Series*

**BO.793 (03/92)** Partitioning of noise between feeder links for the broadcasting-satellite service (BSS) and BSS downlinks

*6pp*

*ITU-R Recommendations, Volume 2000 – BO Series*

**BO.794 (03/92)** Techniques for minimizing the impact on the overall BSS system performance due to rain along the feeder-link path

*11pp*

*ITU-R Recommendations, Volume 2000 – BO Series*

**BO.795 (03/92)** Techniques for alleviating mutual interference between feeder links to the BSS

*4pp*

*ITU-R Recommendations, Volume 2000 – BO Series*

- BO.1130-4 (04/01)** Systems for digital satellite broadcasting to vehicular, portable and fixed receivers in the bands allocated to BSS (sound) in the frequency range 1 400-2 700 MHz  
89pp  
*ITU-R Recommendations, Supplement 1 to Volume 2000 – BO Series*
- BO.1211 (10/95)** Digital multi-programme emission systems for television, sound and data services for satellites operating in the 11/12 GHz frequency range  
22pp  
*ITU-R Recommendations, Volume 2000 – BO Series*
- BO.1212 (10/95)** Calculation of total interference between geostationary-satellite networks in the broadcasting-satellite service  
22pp  
*ITU-R Recommendations, Volume 2000 – BO Series*
- BO.1213 (10/95)** Reference receiving earth station antenna patterns for replanning purposes to be used in the revision of the WARC-77 BSS plans for Regions 1 and 3  
4pp  
*ITU-R Recommendations, Volume 2000 – BO Series*
- BO.1293-2 (04/02)** Protection masks and associated calculation methods for interference into broadcast-satellite systems involving digital emissions  
11pp
- BO.1295 (10/97)** Reference transmit Earth station antenna off-axis e.i.r.p. patterns for planning purposes to be used in the revision of the Appendix 30A (Orb-88) Plans of the Radio Regulations at 14 GHz and 17 GHz in Regions 1 and 3  
3pp  
*ITU-R Recommendations, Volume 2000 – BO Series*
- BO.1296 (10/97)** Reference receive space station antenna patterns for planning purposes to be used for elliptical beams in the revision of the Appendix 30A (Orb-88) Plans of the Radio Regulations at 14 GHz and 17 GHz in Regions 1 and 3  
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*ITU-R Recommendations, Volume 2000 – BO Series*
- BO.1297 (10/97)** Protection ratios to be used for planning purposes in the revision of the Appendices 30 (Orb-85) and 30A (Orb-88) Plans of the Radio Regulations in Regions 1 and 3  
1pp  
*ITU-R Recommendations, Volume 2000 – BO Series*
- BO.1373-1 (04/02)** Use of BSS assignments for FSS transmissions  
3pp
- BO.1383 (12/98)** Introduction of the broadcasting-satellite service (sound) in the same frequency bands as used by mobile aeronautical telemetry systems in the frequency range 1-3 GHz  
1pp  
*ITU-R Recommendations, Volume 2000 – BO Series*
- BO.1408-1 (04/02)** Transmission system for advanced multimedia services provided by integrated services digital broadcasting in a broadcasting-satellite channel  
16pp
- BO.1443-1 (04/02)** Reference BSS earth station antenna patterns for use in interference assessment involving non-GSO satellites in frequency bands covered by RR Appendix 30  
10pp
- BO.1444 (03/00)** Protection of the BSS in the 12 GHz band and associated feeder links in the 17 GHz band from interference caused by non-GSO FSS systems  
18pp  
*ITU-R Recommendations, Volume 2000 – BO Series*
- BO.1445 (03/00)** Improved patterns for fast roll-off satellite transmit antennas of the Regions 1 and 3 BSS plans of RR Appendix S30  
3pp  
*ITU-R Recommendations, Volume 2000 – BO Series*
- BO.1503 (05/00)** Functional description to be used in developing software tools for determining conformity of non-GSO FSS networks with limits contained in Article S22 of the Radio Regulation (Resolutions ITU-R 130, 538 (CMR-97))  
Note – Identical to Rec. UIT-R S.1503  
1pp  
*ITU-R Recommendations, Volume 2000 – S Series – Part 3*
- BO.1504 (07/00)** Effective utilization of spectrum assigned to the broadcasting-satellite service (sound)  
10pp  
*ITU-R Recommendations, Supplement 1 to Volume 2000 – BO Series*

**BO.1505 (07/00)** Coordination procedure for assignments of space operation service in the guardbands of Appendices S30 and S30A Plans of the Radio Regulations  
*4pp*  
*ITU-R Recommendations, Supplement 1 to Volume 2000 – BO Series*

**BO.1506 (07/00)** A methodology to evaluate the impact of solar interference on GSO BSS link performance  
*14pp*  
*ITU-R Recommendations, Supplement 1 to Volume 2000 – BO Series*

**BO.1516 (04/01)** Digital multiprogramme television systems for use by satellites operating in the 11/12 GHz frequency range  
Note – This Recommendation replaces Rec. ITU-R BO.1294  
*72pp*

**BO.1517 (04/01)** Equivalent power flux-density limits, epfd, to protect the broadcasting-satellite service in the 12 GHz band from interference caused by non-geostationary fixed-satellite service systems  
*10pp*  
*ITU-R Recommendations, Supplement 1 to Volume 2000 – BO Series*

**BO.1597-0 (10.02)** Methodology for the calculation of the worst-case interference levels between non-geostationary broadcasting-satellite service (sound) systems using highly-elliptical orbit and geostationary orbit satellite networks operating in the band 2 630-2 655 MHz  
*5pp*

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

**BR.265-8 (10/97)** Standards for the international exchange of programmes on film for television use  
*9pp*  
*ITU-R Recommendations, Volume 2000 – BR Series*

**BR.408-7 (04/01)** International exchange of sound programmes recorded in analogue form  
Note – This Recommendation replaces Rec. ITU-R BR.407-4  
*3pp*  
*ITU-R Recommendations, Supplement 1 to Volume 2000 – BR Series*

**BR.469-7 (06/02)** Analogue composite television tape recording  
Approved in accordance with Resolution ITU-R 45  
*8pp*

**BR.602-4 (03/00)** Exchange of television recordings for programme evaluation  
*2pp*  
*ITU-R Recommendations, Volume 2000 – BR Series*

**BR.649-1 (03/92)** Measuring methods for analogue audio tape recordings  
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*ITU-R Recommendations, Volume 2000 – BR Series*

**BR.657-2 (03/92)** Digital television tape recording. Standards for the international exchange of television programmes on magnetic tape  
*21pp*  
*ITU-R Recommendations, Volume 2000 – BR Series*

**BR.714-2 (12/01)** International exchange of programmes produced by means of high-definition television  
Approved in accordance with Resolution ITU-R 45  
*2pp*

**BR.715-1 (04/01)** International exchange of analogue electronic news gathering recordings  
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*ITU-R Recommendations, Supplement 1 to Volume 2000 – BR Series*

**BR.777-3 (04/01)** International exchange of two-channel digital audio recordings  
Note – This Recommendation replaces Rec. ITU-R BR.648  
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**BR.778-1 (08/94)** Analogue component television tape recording. Standards for the international exchange of television programmes on magnetic tapes  
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**BR.779-1 (10/97)** Operating practices for digital television recording  
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**BR.780-1 (04/02)** Time and control code standards for the international exchange of television programmes on magnetic tapes  
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- BR.785-1 (04/01)** The release of programmes in a multiple release media environment  
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- BR.1215 (10/95)** Handling and storage of television and sound recordings on magnetic tape  
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*ITU-R Recommendations, Volume 2000 – BR Series*
- BR.1216-1 (04/01)** Recording of television or sound programmes on magnetic tape in the case when several programmes are intended for broadcasting in the same digital multiplex  
Note – This Recommendation replaces Rec. ITU-R BR.1214  
2pp  
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- BR.1218-1 (04/01)** Recording of ancillary data on digital recorders for consumer use  
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- BR.1219 (10/95)** Handling and storage of cinematographic film recording  
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- BR.1220-1 (04/01)** Requirements for the generation, recording and presentation of high definition television programmes intended for release in the “electronic cinema”  
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*ITU-R Recommendations, Supplement 1 to Volume 2000 – BR Series*
- BR.1287-1 (04/01)** Broadcasting of programmes on film with multichannel sound  
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*ITU-R Recommendations, Supplement 1 to Volume 2000 – BR Series*
- BR.1290 (10/97)** Use of television disk recording in broadcasters’ operations  
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*ITU-R Recommendations, Volume 2000 – BR Series*
- BR.1292 (10/97)** Engineering guidelines for video recording in standard definition television production and post-production chains  
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- BR.1351 (02/98)** Requirements for the application of digital technology to audio archiving systems for radio broadcasting  
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- BR.1352-2 (06/02)** File format for the exchange of audio programme materials with metadata on information technology media  
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- BR.1355-1 (03/00)** Viewing conditions for telecine transfer of film images on a television display  
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- BR.1356 (02/98)** User requirements for application of compression in television production  
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- BR.1375-2 (06/02)** High-definition television (HDTV) recording  
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- BR.1384 (12/98)** Parameters for international exchange of multi-channel sound recordings  
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**BR.1422 (12/99)** Operational practices for television use of film soundtracks encoded with noise reduction and matrix surround

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8pp

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**BR.1530 (06/01)** Guide to Recommendations on the use of film in television

Approved in accordance with Resolution ITU-R 45

5pp

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**BR.1531 (06/01)** Exchange of sound programmes for broadcast use recorded as broadcast wave format files on compact and digital versatile recordable data disks

Approved in accordance with Resolution ITU-R 45

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**BR.1574 (06/02)** Archival of sound-program material in the form of files recorded on information technology media

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2pp

**BR.1575 (06/02)** Guide to the selection of digital video tape recording formats for studio production in the standard definition television (SDTV) environment based on production requirements

Approved in accordance with Resolution ITU-R 45

8pp

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**BS.48-2 (07/86)** Choice of frequency for sound broadcasting in the Tropical Zone

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*ITU-R Recommendations, Volume 2000 – BS Series – Part 1*

**BS.80-3 (06/90)** Transmitting antennas in HF broadcasting

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*ITU-R Recommendations, Volume 2000 – BS Series – Part 1*

**BS.139-3 (06/90)** Transmitting antennas for sound broadcasting in the Tropical Zone

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*ITU-R Recommendations, Volume 2000 – BS Series – Part 1*

**BS.215-2 (07/82)** Maximum transmitter powers for broadcasting in the Tropical Zone

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*ITU-R Recommendations, Volume 2000 – BS Series – Part 1*

**BS.216-2 (07/82)** Protection ratio for sound broadcasting in the Tropical Zone

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**BS.411-4 (06/90)** Fading allowances in HF broadcasting

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- BS.415-2 (07/86)** Minimum performance specifications for low-cost sound-broadcasting receivers  
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- BS.467 (07/70)** Technical characteristics to be checked for frequency-modulation stereophonic broadcasting  
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*ITU-R Recommendations, Volume 2000 – BS Series – Part 1*
- BS.468-4 (07/86)** Measurement of audio-frequency noise voltage level in sound broadcasting  
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- BS.498-2 (06/90)** Ionospheric cross-modulation in the LF and MF broadcasting bands  
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- BS.559-2 (06/90)** Objective measurement of radio-frequency protection ratios in LF, MF and HF broadcasting  
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- BS.560-4 (10/97)** Radio-frequency protection ratios in LF, MF and HF broadcasting  
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- BS.561-2 (07/86)** Definitions of radiation in LF, MF and HF broadcasting bands  
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- BS.562-3 (06/90)** Subjective assessment of sound quality  
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- BS.597-1 (07/86)** Channel spacing for sound broadcasting in band 7 (HF)  
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- BS.598-1 (06/90)** Factors influencing the limits of amplitude-modulation sound-broadcasting coverage in band 6 (MF)  
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- BS.599 (07/82)** Directivity of antennas for the reception of sound broadcasting in band 8 (VHF)  
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- BS.638 (07/86)** Terms and definitions used in frequency planning for sound broadcasting  
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- BS.639 (07/86)** Necessary bandwidth of emission in LF, MF and HF broadcasting  
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- BS.643-2 (10/95)** System for automatic tuning and other applications in FM radio receivers for use with the pilot-tone system  
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- BS.644-1 (06/90)** Audio quality parameters for the performance of a high-quality sound-programme transmission chain  
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- BS.645-2 (03/92)** Test signals and metering to be used on international sound programme connections  
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- BS.646-1 (03/92)** Source encoding for digital sound signals in broadcasting studios  
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- BS.647-2 (03/92)** A digital audio interface for broadcasting studios  
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- BS.702-1 (03/92)** Synchronization and multiple frequency use per programme in HF broadcasting  
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- BS.703 (06/90)** Characteristics of AM sound broadcasting reference receivers for planning purposes  
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*ITU-R Recommendations, Volume 2000 – BS Series – Part 1*
- BS.704 (06/90)** Characteristics of FM sound broadcasting reference receivers for planning purposes  
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*ITU-R Recommendations, Volume 2000 – BS Series – Part 1*
- BS.705-1 (10/95)** HF transmitting and receiving antennas characteristics and diagrams  
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*ITU-R Recommendations, Volume 2000 – BS Series – ITU-R Rec. BS.705-1, ITU-R Rec. BS.1195 and ITU-R Rec. BS.1386*
- BS.706-2 (02/98)** Data system in monophonic AM sound broadcasting (AMDS)  
43pp  
*ITU-R Recommendations, Volume 2000 – BS Series – Part 1*
- BS.707-4 (12/98)** Transmission of multisound in terrestrial television systems PAL B, D1, G, H and I, and SECAM D, K, K1 and L  
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*ITU-R Recommendations, Volume 2000 – BS Series – Part 1*
- BS.708 (06/90)** Determination of the electro-acoustical properties of studio monitor headphones  
5pp  
*ITU-R Recommendations, Volume 2000 – BS Series – Part 2*
- BS.773 (03/92)** Radio-frequency protection ratios required by FM sound broadcasting in the band between 87.5 MHz and 108 MHz against interference from D/SECAM television transmissions  
4pp  
*ITU-R Recommendations, Volume 2000 – BS Series – Part 1*
- BS.774-2 (10/95)** Service requirements for digital sound broadcasting to vehicular, portable and fixed receivers using terrestrial transmitters in the VHF/UHF bands  
2pp  
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- BS.775-1 (07/94)** Multichannel stereophonic sound system with and without accompanying picture  
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- BS.776 (03/92)** Format for user data channel of the digital audio interface  
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- BS.1115 (07/94)** Low bit-rate audio coding  
9pp  
*ITU-R Recommendations, Volume 2000 – BS Series – Part 2*
- BS.1116-1 (10/97)** Methods for the subjective assessment of small impairments in audio systems including multichannel sound systems  
26pp  
*ITU-R Recommendations, Volume 2000 – BS Series – Part 2*
- BS.1194-2 (12/98)** System for multiplexing frequency modulation (FM) sound broadcasts with a sub-carrier data channel having a relatively large transmission capacity for stationary and mobile reception  
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*ITU-R Recommendations, Volume 2000 – BS Series – Part 1*
- BS.1195 (10/95)** Transmitting antenna characteristics at VHF and UHF  
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This Recommendation replaces  
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