BOCRA

ANNEX E-BROADCAST EQUIPMENT TECHNICAL SPECIFICATIONS

REVIEW OF TYPE APPROVAL TECHNICAL STANDARDS AND PROCEDURES

ISSUED BY

BOTSWANA COMMUNICATIONS REGULATORY AUTHORITY

Date: 14 March 2016

INDEX Broadcast Systems

BOCRA

TECHNICAL SPECIFICATION

FOR

RADIO MF/HF (AM) BROADCAST EQUIPMENT

ISSUED BY

BOTSWANA COMMUNICATIONS REGULATORY AUTHORITY

Document Number:	**TS0100**
Revision:	**Original V1**
Date:	**11 December 2015**

Technical Specification
for
Radio MF/HF (AM) Broadcast equipment

Contents

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Scope

This specification applies to all radio MF (AM) broadcast equipment to be used in Botswana

Entry into Force

This specification shall enter into force on 15/01/2016

Document History

Description	Status	Date
Radio MF (AM) Broadcast Equipment	Original V1	11/12/2015

Spectrum Allocation

The frequency bands between 150 and 285 kHz and between 525 and 1 605 kHz allocated to the MF (AM) broadcasting service under Article 5 of the Radio Regulations, Geneva, 1959

Health, Safety, and Generic Emissions.

The following universal specifications shall be applied

TS0001: Health, Safety and Generic Emissions of Radio and Telecommunications Terminal Equipment

Technical, Spectrum and EMC Requirements

The following specifications shall be applied.

Rule of Procedure related to Annex 2 to the GE75 Agreement, as amended by decision of the RRB in December 2002 for the Radio MF/HF (AM) broadcast standards for Botswana

In ITU Regions 1 and 3, the GE75 LF/MF Final Acts provide a plan for the assignment of frequencies to broadcasting stations, a modification procedure (Article 4) and the technical details to be used for the preparation of the plan. This Agreement is based on analogue Amplitude Modulated Double-Side Band (AM DSB) transmissions

ETSI EN 301 489-11 V 1.3.1: Electromagnetic compatibility and Radio Spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 11: Specific conditions for terrestrial sound broadcasting service transmitters Multi-part EMC Standard, for radio equipment EN 301 489-11 (All parts)

ETSI EN 302 017-1 V 1.1.1: Electromagnetic compatibility and Radio Spectrum Matters (ERM); Transmitting equipment for the Amplitude Modulated (AM) sound broadcasting service; Part 1: Technical characteristics and test methods. Transmitting equipment for the amplitude-modulated broadcast radio service

ETSI EN 302 017-2 V 1.1.1: Electromagnetic compatibility and Radio Spectrum Matters (ERM); Transmitting equipment for the Amplitude Modulated (AM) sound broadcasting service; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive. Transmitting equipment for the amplitude-modulated broadcast radio service

Important Note: The revision numbers of the documents given in the approval standard are the minimum standards that apply. Should updated versions of these documents be published, the latest version will always apply. This also applies to documents where no revision number is currently quoted

Additional Requirements

Additional requirements exist for the use of Radio MF/HF (AM) broadcast and ancillary equipment at this time. A licence must be obtained before equipment of this type can be used in Botswana. This licence will detail conditions of use and any additional requirements which must be met.

Obtaining Technical Standards

ETSI technical standards may be obtained free of charge for individual use from the ETSI web site. www.etsi.org

CENELEC, IEC and CISPR standards may be obtained at cost from, or through www.cenelec.org and from www.iec.ch respectively

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TECHNICAL SPECIFICATION

FOR

RADIO VHF (FM) BROADCAST AND ANCILLARY SERVICES (RDS)

ISSUED BY

BOTSWANA COMMUNICATIONS REGULATORY AUTHORITY

Document Number:	**TS0101**
Revision:	**Original V1**
Date:	**11 December 2015**

Technical Specification for Radio Broadcasting Systems; Very High Frequency (VHF), Frequency Modulated, Sound Broadcasting Transmitters and Ancillary Services (RDS)

Contents

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Scope

This specification applies to all radio VHF (FM) broadcasting equipment and ancillary services (RDS) to be used in Botswana

Entry into Force

This specification shall enter into force on 15/01/2016

Document History

Description	Status	Date
Radio VHF (FM) Broadcast and Ancillary Services (RDS)	Original V1	11/12/2015

Spectrum Allocation

The following frequency band has been allocated for use by radio VHF (FM) broadcast and ancillary equipment in Botswana: 87.5 MHz to 108.0 MHz

Health, Safety, and Generic Emissions

The following universal specifications shall be applied.

TS0001: Health, Safety and Generic Emissions of Radio and Telecommunications Terminal Equipment

Technical, Spectrum and EMC Requirements

The following specifications shall be applied.

ETSI ETS 300 384/A1 ed.1 Radio broadcasting systems; Very High Frequency (VHF), frequency modulated, sound broadcasting transmitters

ETSI EN 301 489-11 V 1.3.1: Electromagnetic compatibility and Radio Spectrum Matters (ERM); Electro Magnetic Compatibility (EMC) standard for radio equipment and services; Part 11: Specific conditions for terrestrial sound broadcasting service transmitters Multi-part EMC Standard, for radio equipment EN 301 489-XX (All parts)

ETSI EN 302 018-1 V 1.2.1: Electromagnetic compatibility and Radio Spectrum Matters (ERM); Transmitting equipment for the Frequency Modulated (FM) sound broadcasting service; Part 1: Technical characteristics and test methods. Frequency Modulated (FM) sound broadcasting transmitters

ETSI EN 302 018-2 V 1.2.1: Electromagnetic compatibility and Radio Spectrum Matters (ERM); Transmitting equipment for the Frequency Modulated (FM) sound broadcasting service; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive. Frequency Modulated (FM) sound broadcasting transmitters

EN 50067 Specification of the radio data system (RDS) for VHF/FM sound broadcasting in the frequency range from 87.5 to 108.0 MHz

Important Note: The revision numbers of the documents given in the approval standard are the minimum standards that apply. Should updated versions of these documents be published, the latest version will always apply. This also applies to documents where no revision number is currently quoted

Additional Requirements

Additional requirements exist for the use of Radio VHF (FM) broadcast and ancillary equipment at this time. A licence must be obtained before equipment of this type can be used in Botswana. This licence will detail conditions of use and any additional requirements which must be met

Obtaining Technical Standards

ETSI technical standards may be obtained free of charge for individual use from the ETSI web site. www.etsi.org

CENELEC, IEC and CISPR standards may be obtained at cost from, or through www.cenelec.org and from www.iec.ch respectively

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TECHNICAL SPECIFICATION

FOR

TELEVISION ANALOGUE PAL I VHF AND UHF BROADCAST SERVICES

ISSUED BY

BOTSWANA COMMUNICATIONS REGULATORY AUTHORITY

Document Number:	**TS0102**
Revision:	**Original V1**
Date:	**11 December 2015**

Technical Specification for Television Analogue PAL I VHF and UHF Broadcast Services

Contents

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Scope

This specification applies to all Television Analogue PAL I VHF and UHF Broadcasting equipment to be used in Botswana

Entry into Force

This specification shall enter into force on 15/01/2016

Document History

Description	Status	Date
Television Analogue PAL I VHF and UHF Broadcasting Services	Original V1	11/12/2015

Spectrum Allocation

The following frequency band has been allocated for use of Television Analogue PAL I VHF and UHF broadcast equipment in Botswana: VHF: 174 to 230 MHz, UHF: 470 to 862 MHz

Health, Safety, and Generic Emissions

The following universal specifications shall be applied.

TS0001: Health, Safety and Generic Emissions of Radio and Telecommunications Terminal Equipment

Technical, Spectrum and EMC Requirements

The following specifications shall be applied

RECOMMENDATION ITU-R BT.470-6*: The ITU Radio Communication Assembly, *considering:*

a) that many countries have established satisfactory monochrome television broadcasting services based on either 525-line or 625-line systems;

b) that a number of countries have established (or are in the process of establishing) satisfactory colour television broadcasting services based on the NTSC, PAL or SECAM systems;

c) that the use of video component signals, signals consisting of the luminance and two colour difference signals, with time compression and time division multiplexing, may offer picture quality benefits, using new types of television receivers;

d) that it would add further complications to the interchange of programmes to have a greater multiplicity of systems,

recommends

1 that, for a country wishing to initiate a conventional monochrome television service, a system using 525- or 625-lines as defined in Annex 1 is to be preferred;

2 that, for conventional monochrome 625-line systems, the video-frequency characteristic described in Recommendation ITU-R BT.472 is to be preferred;

3 that, for a country wishing to initiate a conventional colour television service, one of the systems defined in Annex 1 is to be preferred

NOTE 1 – Pre-1986 editions of the ex-CCIR Volumes, and in particular that of 1982, contain a complete description of system E used in France until 1984, and system A used in the United Kingdom until 1985

NOTE 2 – Pre-1997 editions of Recommendation ITU-R BT.470 contain a complete description of the SECAM IV colour television system

ETSI EN 301 489-14 V 1.2.1: Electromagnetic compatibility and Radio Spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 14: Specific conditions for analogue and digital terrestrial TV broadcasting service transmitters. EMC for terrestrial TV broadcast transmitters

ETSI EN 302 297 V 1.1.1: Electromagnetic compatibility and Radio Spectrum Matters (ERM); Transmitting equipment for the analogue television broadcasting service; Harmonized EN under article 3.2 of the R&TTE Directive Transmitting equipment for analogue television broadcast service

Important Note: The revision numbers of the documents given in the approval standard are the minimum standards that apply. Should updated versions of these documents be published, the latest version will always apply. This also applies to documents where no revision number is currently quoted

Additional Requirements

Additional requirements exist for the use of Television Analogue PAL I VHF and UHF Broadcasting equipment at this time. A licence must be obtained before equipment of this type can be used in Botswana. This licence will detail conditions of use and any additional requirements which must be met

Obtaining Technical Standards

ETSI technical standards may be obtained free of charge for individual use from the ETSI web site. www.etsi.org

CENELEC, IEC and CISPR standards may be obtained at cost from, or through www.cenelec.org and from www.iec.ch respectively

BOCRA

TECHNICAL SPECIFICATION

FOR

DIGITAL TERRESTRIAL TELEVISION BROADCASTING SYSTEM (DVB-T2)

ISSUED BY

BOTSWANA COMMUNICATIONS REGULATORY AUTHORITY

Document Number:	**TS0103**
Revision:	**Original V1**
Date:	**11 December 2015**

Technical Specification for Digital Terrestrial Television Broadcasting System (DVB-T2)

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Scope

This specification applies to all digital terrestrial television broadcasting systems (DVB-T2) to be used in Botswana

Entry into Force

This specification shall enter into force on 15/01/2016

Document History

Description	Status	Date
Digital Terrestrial Television Broadcasting System (DVB-T2)	Original V1	11/12/2015

Spectrum Allocation

The following frequency band has been allocated for use of digital terrestrial television broadcasting systems (DVB-T2) in Botswana: VHF: 174 to 230 MHz, UHF: 470 to 862 MHz

Health, Safety, and Generic Emissions

The following universal specifications shall be applied.

TS0001: Health, Safety and Generic Emissions of Radio and Telecommunications Terminal Equipment

Technical, Spectrum and EMC Requirements

The following specifications shall be applied.

ETSI EN 300 429: Informative Reference Document - Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for cable systems

ETSI EN 300 468: Normative Reference Document - "Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems"

ETSI EN 300 744: Normative Reference Document - Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for digital terrestrial television

ETSI EN 301 489-14 V 1.2.1: Electromagnetic compatibility and Radio Spectrum Matters (ERM); Electro Magnetic Compatibility (EMC) standard for radio equipment and services; Part 14: Specific conditions for analogue and digital terrestrial TV broadcasting service transmitters EMC for terrestrial TV broadcast transmitters

ETSI EN 302 296 V1.1.1: Electromagnetic compatibility and Radio Spectrum Matters (ERM); Transmitting equipment for the digital television broadcast service, Terrestrial (DVB-T); Harmonized EN under article 3.2 of the R&TTE Directive. Transmitting equipment for digital television broadcast service

ETSI EN 302 296-2 V1.2.1: Electromagnetic compatibility and Radio Spectrum Matters (ERM); Transmitting equipment for the digital television broadcast service, Terrestrial (DVB-T); Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive. Transmitting equipment for digital television broadcast service

ETSI EN 302 755 V1.4.1(2015-07): Digital Video Broadcasting (DVB); Frame structure channel coding and modulation for a second generation digital terrestrial broadcasting system (DVB-T2)

ETSI TS 101 162: Normative Reference - Digital Video Broadcasting (DVB); Allocation of identifiers and codes for Digital Video Broadcasting (DVB) systems

ETSI TS 102 606: Normative Reference Document - "Digital Video Broadcasting (DVB); Generic Stream Encapsulation (GSE) Protocol"

ETSI TS 102 773 V1.3.1 (Jan 2012): Informative Reference Document - DVB-T2 modulator interface

ETSI TS 102 831: Normative Reference Document - "Digital Video Broadcasting (DVB); Implementation guidelines for a second generation digital terrestrial television broadcasting system (DVB-T2)"

ETSI TS 102 992: Normative Reference - Digital Video Broadcasting (DVB); Structure and modulation of optional transmitter signatures (T2-TX-SIG) for use with the DVB-T2 second generation digital terrestrial television broadcasting system

ISO/IEC 13818-1: Normative Reference Document - "Information technology - Generic coding of moving pictures and associated audio information: Systems"

ISO/IEC 14496: Informative Reference Document - Coding of audio-visual objects (MPEG-4)

Important Note: The revision numbers of the documents given in the approval standard are the minimum standards that apply. Should updated versions of these documents be published, the latest version will always apply. This also applies to documents where no revision number is currently quoted

Additional Requirements

Additional requirements exist for the use of Digital terrestrial television broadcasting system (DVB-T2) at this time. A licence must be obtained before equipment of this type can be used in Botswana. This licence will detail conditions of use and any additional requirements which must be met

Obtaining Technical Standards

ETSI technical standards may be obtained free of charge for individual use from the ETSI web site. www.etsi.org

CENELEC, IEC and CISPR standards may be obtained at cost from, or through www.cenelec.org and from www.iec.ch respectively.

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TECHNICAL SPECIFICATION

FOR

DIGITAL TELEVISION BROADCASTING RECEIVER SYSTEM (DVB-T2)

ISSUED BY

BOTSWANA COMMUNICATIONS REGULATORY AUTHORITY

Document Number:	**TS0104**
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Technical Specification for Digital Television Broadcasting Receiver System (DVB-T2)

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Scope

This specification applies to all digital television satellite receiver broadcasting system (DVB-T2) to be used in Botswana.

Entry into Force

This specification shall enter into force on 15/01/2016.

Document History

Description	Status	Date
Digital Television Broadcasting Receiver System (DVB-T2)	Original V1	11/12/2015

Spectrum Allocation

The following frequency band has been allocated for use of digital terrestrial television broadcasting systems (DVB-T2) in Botswana: VHF: 174 to 230 MHz, UHF: 470 to 862 MHz

Health, Safety, and Generic Emissions

The following universal specifications shall be applied.

TS0001: Health, Safety and Generic Emissions of Radio and Telecommunications Terminal Equipment

Technical, Spectrum and EMC Requirements

The following Standards need to be considered in the design of the DVB-T2 receivers:

ETSI EN 300 468 v1.13.1 (2012-04): Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems

ETSI EN 300 472 v1.3.1 (2003-05): Digital Video Broadcasting (DVB); Specification for Conveying ITU-R System B Teletext in DVB bit-streams

ETSI EN 300 706 v1.2.1 (2003-04): Digital Video Broadcasting (DVB); Enhanced Teletext Specification

ETSI EN 300 743 v1.4.1 (2011-10): Digital Video Broadcasting (DVB); Subtitling systems

ETSI EN 300 744 v1.6.1 (2009-01): Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for digital terrestrial television

ETSI EN 302 755 v1.3.1 (2012-04): Frame structure channel coding and modulation for a second generation digital terrestrial television broadcasting system (DVB-T2)

ETSI ES 202 184: MHEG-5 Broadcast Profile

ETSI TS 101 154 v1.10.1 (2011-06): Digital Video Broadcasting (DVB) Specification for the use of Video and Audio Coding in Broadcasting Applications based on the MPEG-2 Transport Stream

ETSI TS 102 006 v1.3.2 (2008-07): Digital Video Broadcasting (DVB); Specification for System Software Update in DVB Systems

ETSI TS 102 366 v1.2.1 (2008-8): Digital Audio Compression (AC3, Enhanced AC3) Standard

ETSI TR 101 211 v1.9.1 (2009-06): Digital Video Broadcasting (DVB) Guidelines on implementation and usage of Service Information (SI)

ETSI TR 101 162: Digital broadcasting systems for television, sound and data services; Allocation of Service Information (SI) codes for Digital Video Broadcasting (DVB) systems

IEC 60169-2: Radio-frequency connectors – Part 2: Coaxial unmatched connectors

IEC 60728-5: Cable networks for television signals, sound signals and interactive services – Part 5

ISO/IEC 13818-3 (Apr 1998): Information technology - Generic coding of moving pictures and associated audio information - Part 3: Audio

ISO/IEC 14496-3 (Sep 2009): Information technology - Coding of audio-visual objects - Part 3: Audio

ISO/IEC 3166-1: Countries and Subdivisions Codes (2006)

ISO/IEC 8859: Information technology 8-bit single-byte coded graphic character sets (1998)

ITU-T Rec. H.222.0 / ISO/IEC 13818-1 (2012): Information technology – Generic coding of moving pictures and associated audio information: Systems

ITU-T Rec. H.262 / ISO/IEC 13818-2 (2012): Information technology – Generic coding of moving pictures and associated audio information: Video

ITU-T Rec. H.264 / ISO/IEC 14496-10 (01/2012): Infrastructure of audio-visual services - Coding of moving video: Advanced video coding for generic audio-visual services

ITU-R Rec. BT.653-3 (02/1998): Teletext systems

NorDig Rules of Operation, ver 1.0 - As applicable: minimum standard reference

NorDig Unified Test plan, ver 2.4 - As applicable: minimum standard reference

NorDig Unified Requirements ver 2.5.1- As applicable: minimum standard reference

Important Note: The revision numbers of the documents given in the approval standard are the minimum standards that apply. Should updated versions of these documents be published, the latest version will always apply. This also applies to documents where no revision number is currently quoted

Additional Requirements

Additional requirements exist for the use of Digital terrestrial television broadcasting system (DVB-T2) at this time. A licence must be obtained before equipment of this type can be used in Botswana. This licence will detail conditions of use and any additional requirements which must be met.

Obtaining Technical Standards

ETSI technical standards may be obtained free of charge for individual use from the ETSI web site. www.etsi.org

CENELEC, IEC and CISPR standards may be obtained at cost from, or through www.cenelec.org and from www.iec.ch respectively

TECHNICAL SPECIFICATION

FOR

RADIO BROADCASTING SYSTEMS; DIGITAL RADIO MONDIALE (DRM)

ISSUED BY

BOTSWANA COMMUNICATIONS REGULATORY AUTHORITY

Document Number:	**TS00105**
Revision:	**Original V1**
Date:	**11 December 2015**

Technical Specification
for
Radio Broadcasting Systems; DRM

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Scope

This specification applies to all DRM systems to be used in Botswana.

Entry into Force

This specification shall enter into force on 15/01/2016.

Document History

Description	Status	Date
Radio Broadcasting Systems; DRM	Original V1	11/12/2015

Spectrum Allocation

The following frequency band has been allocated for use:

DRM30 transmitters operating in the harmonized LF, MF and HF terrestrial sound broadcast bands. DRM+ to operate in the FM terrestrial sound broadcast band and beyond. (Not yet included in the current broadcast frequency plan)

Health, Safety, and Generic Emission

The following universal specifications shall be applied.

TS0001: Health, Safety and Generic Emissions of Radio and Telecommunications Terminal Equipment

Technical, Spectrum and EMC Requirements

The following specifications shall be applied

ETSI EN 301 489-11 V 1.3.1: Electromagnetic compatibility and Radio Spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 11: Specific conditions for terrestrial sound broadcasting service transmitters Multi-part EMC Standard, for radio equipment EN 301 489-XX (All parts)

ETSI EN 302 245-1 V1.1.1: Electromagnetic compatibility and Radio Spectrum Matters (ERM); Transmitting equipment for the Digital Radio Mondiale (DRM) broadcasting service Part 1: Technical characteristics and test methods

ETSI EN 302 245-2 V1.1.1: Electromagnetic compatibility and Radio Spectrum Matters (ERM); Transmitting equipment for the Digital Radio Mondiale (DRM) broadcasting service; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive

ETSI ES 201 980 V3.2.1 (2012-06): Digital Radio Mondiale (DRM) System Specification
http://www.drm.org/wp-content/uploads/2013/09/DRM-guide-artwork-9-2013-1.pdf DRM Introduction and Implementation Guide. Digital Radio Consortium

Important Note: The revision numbers of the documents given in the approval standard are the minimum standards that apply. Should updated versions of these documents be published, the latest version will always apply. This also applies to documents where no revision number is currently quoted

Additional Requirements

Additional requirements exist for the use of DRM at this time. A licence must be obtained before equipment of this type can be used in Botswana. This licence will detail conditions of use and any additional requirements which must be met

Obtaining Technical Standards

ETSI technical standards may be obtained free of charge for individual use from the ETSI web site. www.etsi.org

CENELEC, IEC and CISPR standards may be obtained at cost from, or through www.cenelec.org and from www.iec.ch respectively

TECHNICAL SPECIFICATION

FOR

DIGITAL TELEVISION BROADCASTING SYSTEM (DVB-S2)

ISSUED BY

BOTSWANA COMMUNICATIONS REGULATORY AUTHORITY

Document Number:	**TS0106**
Revision:	**Original V1**
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Technical Specification
for
Digital Television Broadcasting System (DVB-S2)

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Scope

This specification applies to all digital television broadcasting systems (DVB-S2) to be used in Botswana.

Entry into Force

This specification shall enter into force on 15/01/2016

Document History

Description	Status	Date
Digital Television Broadcasting System (DVB-S2)	Original V1	11/12/2015

Spectrum Allocation

The following frequency band has been allocated for use of DTH digital television broadcasting systems (DVB-S2) in Botswana: 10.7 - 12.75 GHz as per ITU Region 1 (Europe, Russia and Africa) and as further qualified in the Botswana radio frequency Plan

Health, Safety, and Generic Emissions

The following universal specifications shall be applied.

TS0001: Health, Safety and Generic Emissions of Radio and Telecommunications Terminal Equipment

Technical, Spectrum and EMC Requirements

The following specifications shall be applied

ETSI EN 300 429: Normative Reference Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for cable systems"

ETSI EN 300 468: Normative Reference Document Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems"

ETSI EN 301 192: Normative Reference Digital Video Broadcasting (DVB); DVB specification for data broadcasting"

ETSI EN 301 195: Normative Reference Document Digital Video Broadcasting (DVB); Interaction channel through the Global System for Mobile communications (GSM)"

ETSI EN 301 210: Normative Reference Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for Digital Satellite News Gathering (DSNG) and other contribution applications by satellite"

ETSI EN 301 790: Normative Reference Document Digital Video Broadcasting (DVB); Interaction channel for satellite distribution systems"

ETSI EN 302 307: Standard Document for DVB-S2
Second generation framing structure, channel coding and modulation systems for Broadcasting, Interactive Services, News Gathering and other broadband satellite applications

ETSI TS 101 545-1: Normative Reference Document" Digital Video Broadcasting (DVB); Second Generation DVB Interactive Satellite System (DVB-RCS2); Part 1: Overview and System Level specification"

ETSI TS 102 606: Informative Reference Document Digital Video Broadcasting (DVB); Generic Stream Encapsulation (GSE) Protocol"

ETS 300 801: Normative Reference Document Digital Video Broadcasting (DVB); Interaction channel through Public Switched Telecommunications Network (PSTN)/ Integrated Services Digital Networks (ISDN)"

ETS 300 802: Normative Reference Document" Digital Video Broadcasting (DVB); Network-independent protocols for DVB interactive services

ETSI ES 200 800: Normative Reference Document Digital Video Broadcasting (DVB); DVB interaction channel for Cable TV distribution systems (CATV)

ISO/IEC 13818-1: Informative Reference Document
Information technology – Generic coding of moving pictures and associated audio information: Systems"

ISO/IEC 14496: Informative Reference Document
Coding of audio-visual objects (MPEG-4)

Recommendation ITU-R SNG.770-1: Normative Reference Document
Uniform operational procedures for satellite news gathering (SNG)"
The main features of SNG systems are essentially defined by the uplink characteristics. Operations with the SNG uplink terminal assumes that the receiving side is appropriately dimensioned. To ensure system compatibility and efficient operation, it is necessary to standardize equipment characteristics and operating procedures. The functions of the SNG system are to: ñ transmit with a minimum of impairments, a vision and associated sound or sound programme signal; ñ provide limited receiving capability to assist in pointing the antenna and to monitor the transmitted signals, where possible; ñ provide two-way communication channels for operation

Important Note: The revision numbers of the documents given in the approval standard are the minimum standards that apply. Should updated versions of these documents be published, the latest version will always apply. This also applies to documents where no revision number is currently quoted

Additional Requirements

Additional requirements exist for the use of Digital terrestrial television broadcasting system (DVB-S2) at this time. A licence must be obtained before equipment of this type can be used in Botswana. This licence will detail conditions of use and any additional requirements which must be met

Obtaining Technical Standards

ETSI technical standards may be obtained free of charge for individual use from the ETSI web site. www.etsi.org

CENELEC, IEC and CISPR standards may be obtained at cost from, or through www.cenelec.org and from www.iec.ch respectively.

TECHNICAL SPECIFICATION

FOR

DIGITAL TELEVISION BROADCASTING RECEIVER SYSTEM (DVB-S2)

ISSUED BY

BOTSWANA COMMUNICATIONS REGULATORY AUTHORITY

Document Number:	**TS0107**
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Technical Specification for Digital Television Broadcasting Receiver System (DVB-S2)

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Scope

This specification applies to all digital television satellite receiver broadcasting system (DVB-S2) to be used in Botswana

Entry into Force

This specification shall enter into force on 15/01/2016

Document History

Description	Status	Date
Digital Television Broadcasting Receiver System (DVB-S2)	Original V1	11/12/2015

Spectrum Allocation

The following frequency band has been allocated for use of DTH digital broadcasting Satellite receiver television systems (DVB-S2) in Botswana: 10.7 - 12.75 GHz as per ITU Region 1 and as further qualified in the current Botswana radio frequency Plan

Health, Safety, and Generic Emissions

The following universal specifications shall be applied.

TS0001: Health, Safety and Generic Emissions of Radio and Telecommunications Terminal Equipment

Technical, Spectrum and EMC Requirements

ETSI EN 300 468 v1.13.1 (2012-04): Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems

ETSI EN 300 472 v1.3.1 (2003-05): Digital Video Broadcasting (DVB); Specification for Conveying ITU-R System B Teletext in DVB bit-streams

ETSI EN 300 706 v1.2.1 (2003-04): Digital Video Broadcasting (DVB); Enhanced Teletext Specification

ETSI EN 300 743 v1.4.1 (2011-10): Digital Video Broadcasting (DVB); Subtitling systems

ETSI EN 302 307: Digital Video Broadcasting (DVB); Second generation framing structure, channel coding and modulation systems for Broadcasting, Interactive Services, News Gathering and other broadband satellite applications (DVB-S2)

ETSI EN 302 755 v1.3.1 (2012-04): Frame structure channel coding and modulation for a second generation digital terrestrial television broadcasting system (DVB-T2)

ETSI ES 202 184: MHEG-5 Broadcast Profile

ETS 300 421: Digital broadcasting systems for television, sound and data services; Framing structure, channel coding and modulation for 11/12 GHz satellite services

ETS 300 743: DVB System Software Update (SSU)

ETSI TR 101 162: Digital broadcasting systems for television, sound and data services; Allocation of Service Information (SI) codes for Digital Video Broadcasting (DVB) systems

ETSI TR 101198-V1.1.1: Digital Video Broadcasting (DVB); Implementation of Binary Phase Shift Keying (BPSK) modulation in DVB satellite transmission systems

ETSI TR 101 211 v1.9.1 (2009-06): Digital Video Broadcasting (DVB) Guidelines on implementation and usage of Service Information (SI)

ETSI TS 101 154 v1.10.1 (2011-06): Digital Video Broadcasting (DVB); Specification for the use of Video and Audio Coding in Broadcasting Applications based on the MPEG-2 Transport Stream

ETSI TS 102 006 v1.3.2 (2008-07): Digital Video Broadcasting (DVB); Specification for System Software Update in DVB Systems

ETSI TS 102 366 v1.2.1 (2008-8): Digital Audio Compression (AC3, Enhanced AC3) Standard

IEC 60169-2 (1995): Radio-frequency connectors, Part 2: Coaxial unmatched connectors

ISO/IEC 3166-1: Countries and Subdivisions Codes (2006)

ISO/IEC 8859: Information technology 8-bit single-byte coded graphic character sets (1998)
objects —Part 3: Audio

ISO/IEC 13818-3 (Apr 1998): Information technology — Generic coding of moving pictures and associated audio information- Part 3: Audio

ISO/IEC 14496-3 (Sep 2009): Information technology — Coding of audio-visual

ITU-T Rec. H.222.0 / ISO/IEC 13818-1 (2012): Information technology – Generic coding of moving pictures and associated audio information: Systems

ITU-T Rec. H.262 / ISO/IEC 13818-2 (2012): Information technology – Generic coding of moving pictures and associated audio information: Video

ITU-T Rec. H.264 / ISO/IEC 14496-10 (01/2012): Infrastructure of audio-visual services – Coding of moving video: Advanced video coding for generic audio-visual services

ITU-R Rec. BT.653-3 (02/1998): Teletext systems

NorDig Rules of Operation, ver 1.0 - As applicable: minimum standard reference

NorDig Unified Test plan, ver 2.4 - As applicable: minimum standard reference

NorDig Unified Requirements ver 2.5.1 - As applicable: minimum standard reference

Important Note: The revision numbers of the documents given in the approval standard are the minimum standards that apply. Should updated versions of these documents be published, the latest version will always apply. This also applies to documents where no revision number is currently quoted

Additional Requirements

Additional requirements exist for the use of Digital terrestrial television broadcasting system (DVB-S2) at this time. A licence must be obtained before equipment of this type can be used in Botswana. This licence will detail conditions of use and any additional requirements which must be met.

Obtaining Technical Standards

ETSI technical standards may be obtained free of charge for individual use from the ETSI web site. www.etsi.org

CENELEC, IEC and CISPR standards may be obtained at cost from, or through www.cenelec.org and from www.iec.ch respectively

TECHNICAL SPECIFICATION

FOR

DIGITAL TELEVISION BROADCASTING SYSTEM ISDB-T

ISSUED BY

BOTSWANA COMMUNICATIONS REGULATORY AUTHORITY

Document Number:	**TS0108**
Revision:	**Original V1**
Date:	**11 December 2015**

Technical Specification for Digital Television Broadcasting System (ISDB-T)

Contents

Issued by:

Botswana Communications Regulatory Authority
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Scope

This specification applies to all digital television broadcasting systems (ISDB-T) to be used in Botswana.

Entry into Force

This specification shall enter into force on 15/01/2016

Document History

Description	Status	Date
Digital Television Broadcasting System (ISDB-T)	Original V1	11/12/2015

Spectrum Allocation

The following frequency band has been allocated for use of digital television broadcasting systems (ISDB-T) in Botswana: VHF: 174 to 230 MHz, UHF: 470 to 862 MHz

Health, Safety, and Generic Emissions

The following universal specifications shall be applied.

TS0001: Health, Safety and Generic Emissions of Radio and Telecommunications Terminal Equipment

Technical, Spectrum and EMC Requirements

The following specifications shall be applied

ARIB STD-B21 Version 4.6-E1: Receiver for Digital Broadcasting

ARIB STD-B24 V 5.2-E1: Data Coding and Transmission Specification for Digital Broadcasting

ARIB STD-B31 V 2.2-E1: Transmission system for digital terrestrial television broadcasting

ARIB STD-B32 V 1.5, (2004):, Video coding, audio coding and multiplexing specifications for digital broadcasting

ETSI EN 301 489-14 V 1.2.1: Electromagnetic compatibility and Radio Spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 14: Specific conditions for analogue and digital terrestrial TV broadcasting service transmitters EMC for terrestrial TV broadcast transmitters

ETSI EN 302 296 V1.1.1: (As applicable to ISDB-T deployment) Electromagnetic compatibility and Radio Spectrum Matters (ERM); Transmitting equipment for the digital television broadcast service, Terrestrial (DVB-T); Harmonized EN under article 3.2 of the R&TTE Directive Transmitting equipment for digital television broadcast service

ETSI EN 302 296-2 V1.2.1: (As applicable to ISDB-T deployment) Electromagnetic compatibility and Radio Spectrum Matters (ERM); Transmitting equipment for the digital television broadcast service, Terrestrial (DVB-T); Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive Transmitting equipment for digital television broadcast service

ITU - R Recommendation BT.2140 part 1 section 2.6.2.5. and as detailed part 2 section 1.8: Transition from analogue to digital terrestrial broadcasting

ITU - R Recommendation BT.709-6 (06/2015): Parameter values for the HDTV standards for production and international program exchange

ITU - R Recommendation BT.601-5: Studio encoding parameters of digital television for standards 4;3 and wide screen 16:9 aspect ratios

ITU - R Recommendation BT.1306 System C annex 1 table 1c: Error-correction, data framing, modulation and emission methods for digital terrestrial television broadcasting

ITU - R Recommendation BT.1206-2: Spectrum limit masks for digital terrestrial television broadcasting

IEC 61169-2: Terminal equipment - Radio-frequency connectors

Important Note: The revision numbers of the documents given in the approval standard are the minimum standards that apply. Should updated versions of these documents be published, the latest version will always apply. This also applies to documents where no revision number is currently quoted

Additional Requirements

Additional requirements exist for the use of Digital terrestrial television broadcasting system (ISDB-T) at this time. A licence must be obtained before equipment of this type can be used in Botswana. This licence will detail conditions of use and any additional requirements which must be met

Obtaining Technical Standards

ETSI technical standards may be obtained free of charge for individual use from the ETSI web site. www.etsi.org

CENELEC, IEC and CISPR standards may be obtained at cost from, or through www.cenelec.org and from www.iec.ch respectively

BOCRA

TECHNICAL SPECIFICATION

FOR

TERRESTRIAL - DIGITAL AUDIO BROADCASTING SERVICE (T-DAB)

ISSUED BY

BOTSWANA COMMUNICATIONS REGULATORY AUTHORITY

Document Number:	**TS0109**
Revision:	**Original V1**
Date:	**11 December 2015**

Technical Specification for T-DAB Broadcast Services

Contents

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Scope

This specification applies to T-DAB Broadcast equipment to be used in Botswana

Entry into Force

This specification shall enter into force on 15/01/2016

Document History

Description	Status	Date
T-DAB Broadcast Services	Original V1	11/12/2015

Spectrum Allocation

The following frequency band has been allocated for use of T - DAB broadcast services in Botswana:
VHF: 174 to 230 MHz; Block 11A-D, Block 12A-D. 230-238 MHz; Block 13A–C. 236–254MHz; Block 13D–F

Health, Safety, and Generic Emissions.

The following universal specifications shall be applied

TS0001: Health, Safety and Generic Emissions of Radio and Telecommunications Terminal Equipment

Technical, Spectrum and EMC Requirements

The following specifications shall be applied

ETSI EN 300 401 V1.4.1 (2006-01): Radio Broadcasting Systems; Digital Audio Broadcasting (DAB) to mobile, portable and fixed receivers. This document establishes a broadcasting standard for the Digital Audio Broadcasting (DAB) system designed for delivery of high-quality digital audio programme and data services for mobile, portable and fixed reception from terrestrial or satellite transmitters in the Very High Frequency (VHF)/Ultra High Frequency (UHF) frequency bands.

ETSI EN 300 797 V1.2.1 (2005-05): Digital Audio Broadcasting (DAB); Distribution interfaces; Service Transport Interface (STI)
This document specifies an interface which allows broadcasters, who are producing a DAB programme or data service component, to transmit this DAB component to the multiplex operator responsible for building the full signal.

ETSI EN 300 798 V1.1.1 (1998-03): Digital Audio Broadcasting (DAB); Distribution interfaces; Digital baseband In-phase and Quadrature (DIQ) interface. Specifies an interface which allows digital processing equipment for DAB to be connected to RF modulation equipment at DAB transmitter sites

ETSI EN 301 234 V2.1.1 (2006-06): Digital Audio Broadcasting (DAB); Multimedia Object Transfer (MOT) protocol. Specification of the DAB Multimedia Object Transfer (MOT) protocol.

ETSI EN 301 700 V1.1.1 (2000-03): Digital Audio Broadcasting (DAB); VHF/FM Broadcasting: cross-referencing to simulcast DAB services by RDS-ODA 147. To produce an EN for the definition and use of a Radio Data System Open Data Application (RDS-ODA) for the cross

referencing of audio services from FM-RDS to DAB. Supporters: Eureka 147 project member companies

ETSI EN 302 077-1 V1.1.1: Electromagnetic compatibility and Radio Spectrum Matters (ERM); Transmitting equipment for the Terrestrial - Digital Audio Broadcasting (T-DAB) service; Part 1: Technical characteristics and test methods

ETSI EN 302 077-2 V1.1.1: Electromagnetic compatibility and Radio Spectrum Matters (ERM); Transmitting equipment for the Terrestrial - Digital Audio Broadcasting (T-DAB) service; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive

ETSI ES 201 735 V1.1.1 (2000-09): Digital Audio Broadcasting (DAB); Internet Protocol (IP) datagram tunnelling. To describe how to transport Internet Protocol (IP) datagrams in a Digital Audio Broadcasting (DAB) packet mode service component, a technique further on referred to as IP tunnelling. TS also to be published while the ES is in the Members' Vote procedure.

ETSI ES 201 736 V1.1.1 (2000-09): Digital Audio Broadcasting (DAB); Network Independent Protocols for Interactive Services
This specifies the protocol stacks to be used for the different types of services that are defined, as local interactive, one-way interactive and two-way interactive service. It also defines a protocol PSSC (Personal DAB Service Session Control) which allows the setup of personal DAB service sessions and functionalities like handover between DAB cells, etc. It also defines the message format to be used and allows for further future extensions

ETSI ES 201 737 V1.1.1 (2000-01): Digital Audio Broadcasting (DAB); Interaction channel through Global System for Mobile communications (GSM) the Public Switched Telecommunications System (PSTN); Integrated Services Digital Network (ISDN) and Digital Enhanced Cordless Telecommunications. This specifies the DAB Interaction Channel through GSM/PSTN/ISDN/DECT and handles low level network questions. It is basically a document with references to relevant telecommunications standards where you will find how to implement the low level interaction part. Supporting ETSI member Organisations; Eureka 147 Project i.e., BBC, Bosch, IRT, Teracom.

ETSI TR 101 495 V1.4.1 (2012-03): Digital Audio Broadcasting (DAB); Guide to DAB standards; Guidelines and Bibliography
This paper explains the different standards for Digital Audio Broadcasting (DAB) that exist, what they cover and how they are inter-related. The main DAB standard ETS 300 401 is explained first of all and the remaining documents are grouped into standards/documents related to the DAB receivers, DAB networks along with transmitters and data transmission via DAB. Sources where one can obtain these

documents and a brief overview of general literature about DAB is also given

ETSI TR 101 496-1 V1.1.1 (2000-11): Digital Audio Broadcasting (DAB); Guidelines and rules for implementation and operation; Part 1: System outline. This TR is based on a EUREKA document and is written as a supplement of the ETS 300 401. Details and explanations are given that help to implement DAB equipment

ETSI TR 101 496-2 V1.1.2 (2001-05): Digital Audio Broadcasting (DAB); Guidelines and rules for implementation and operation; Part 2: System features. This TR is based on a EUREKA document and is written as a supplement of the ETS 300 401. Details and explanations are given that help to implement DAB equipment.

ETSI TR 101 496-3 V1.1.2 (2001-05): Digital Audio Broadcasting (DAB); Guidelines and rules for implementation and operation; Part 3: Broadcast network. This TR is based on a EUREKA document and is written as a supplement of the ETS 300 401. Details and explanations are given that help to implement DAB equipment

ETSI TS 101 498-1 V2.1.1 (2006-01): Digital Audio Broadcasting (DAB); Broadcast website; Part 1: User application specification
The DAB Broadcast website application describes the protocol required to create a broadcast carousel of files for a 'website'. Receivers may then extract information directly from this carousel in order to present the service. The DAB Broadcast website application applies the DAB-MOT protocol and allows a service provider to deliver HTML content via DAB without the need for a return channel. Supporting ETSI member organisations: Eureka 147 Project i.e. BBC Bosh IRT Teracom

ETSI TS 101 498-2 V1.1.1 (2000-09): Digital Audio Broadcasting (DAB); Broadcast website; Part 2: Basic profile specification
The DAB Broadcast website application describes the protocol required to create a broadcast carousel of files for a 'website'. Receivers may then extract information directly from this carousel in order to present the service. The DAB Broadcast website application applies the DAB-MOT protocol and allows a service provider to deliver HTML content via DAB without the need for a return channel. Supporting ETSI member organisations: Eureka 147 Project i.e. BBC Bosh IRT Teracom

ETSI TS 101 498-3 V2.1.1 (2005-10): Digital Audio Broadcasting (DAB); Broadcast website; Part 3: TopNews basic profile specification. This document specifies how to create a broadcast carousel of objects for an audio information service. TopNews allows a service provider to deliver compressed audio, for instance MP3, via digital radio. Receivers may then extract information directly from this carousel and store it in the receiver in order to present the service.

ETSI TS 101 499 V3.1.1 (2015-01): Hybrid Digital Radio Slide-Show
The present document describes an application that provides a visual accompaniment to a radio service. In respect to previous versions of the present document, hybrid radio provisions have been added to allow a seamless experience for users when consuming radio services delivered by digital radio broadcasting systems (DAB, DRM) or IP or a combination of both. The use of the present document allows content to be created once by the service provider for delivery by both mechanisms and allows manufacturers to implement devices with many common elements. The application can be delivered using broadcast or IP, or a combination of the two

ETSI TS 101 756 V1.7.1 (2015-09): Digital Audio Broadcasting (DAB); Conformance testing for DAB Audio, Conformance testing specification, to test the DAB extensions to the MPEG audio specification.

ETSI TS 101 757 V1.1.1 (2000-06): Digital Audio Broadcasting (DAB); Registered Tables. The present document contains a number of tables for use in the implementation of the Digital Audio Broadcasting (DAB), system [1] and the related Multimedia Object Transfer (MOT) standard [4]. The tables in the present document are maintained by the WorldDAB Information and Registration Centre (WorldDAB IRC). The WorldDAB IRC apply an easy procedure for registering new values, to ensure that they may be used without the need to change the so-called "main DAB standard" EN 300 401 [1]

ETSI TS 101 758 V2.1.1 (2000-11): Digital Audio Broadcasting (DAB); Signal strengths and receiver parameters; Targets for typical operation. Gives guidance about the required field strength and receiver sensitivity required for satisfactory DAB operation

ETSI TS 101 759 V1.2.1 (2005-01): Digital Audio Broadcasting (DAB); Data Broadcasting - Transparent Data Channel (TDC)
Specification covering transparent data channel in packet mode, stream mode and Programme Associated Data

ETSI TS 101 860 V1.1.1 (2001-12): Digital Audio Broadcasting (DAB); Distribution Interfaces; Service Transport Interface (STI); STI levels. The document establishes guidance in implementation and usage of the functionality described in the STI standard EN 300 797. Subsets of the STI standard are defined in order to make interoperable solutions possible for different suppliers of STI devices. The subsets are called STI Levels. Interoperability is ensured if the STI Logical Interface (LI) and STI Physical Interfaces (STI-PI,X) are the same for entities transporting DAB Service Components, Service Information and control messages in a DAB collection network. The present document only particularises the Logical Interface (LI) layer of the STI, i.e. the syntax for STI-D frames and STI-C messages, to provide interoperability. The

document defines a functional hierarchy of levels. Higher levels comprise lower levels. Three levels are specified where the highest STI Level does not comprise all STI functionality that could be implemented using EN 300 797. Some of the functionality is not included due to the fact that it is not assumed to be widely used. This functionality may optionally be added to any of the defined STI Levels. The document defines the minimum functionality an upstream or downstream entity shall provide on each level to be considered compliant with that level

ETSI TS 101 993 V1.1.1 (2002-03): Digital Audio Broadcasting (DAB); A Virtual Machine for DAB: DAB Java Specification
Specification of a Java Virtual Machine for DAB

ETSI TS 102 367 V1.2.1 (2006-01): Digital Audio Broadcasting (DAB); Conditional access. The present document specifies how to use Conditional Access within the Digital Audio Broadcasting (DAB) system

ETSI TS 102 368 V1.1.1 (2005-01): Digital Audio Broadcasting (DAB); DAB-TMC (Traffic Message Channel). The present document specifies how to transport RDS-TMC messages using the DAB Fast Information Data channel (FIDC)

ETSI TS 102 371 V3.1.1 (2015-01): Digital Audio Broadcasting (DAB); Digital Radio Mondiale (DRM); Transportation and Binary Encoding Specification for Service and Programme Information (SPI). The present document defines how the XML schema data model for Service and Programme Information (SPI) (ETSI TS 102 818 [1]) should be compressed, profiled and broadcast. Within the present document the term "DAB" is used to refer to the Digital Audio Broadcasting standard (ETSI EN 300 401 [3]) and "DRM" is used to refer to the Digital Radio Mondiale standard (ETSI ES 201 980 [6]). In respect to previous versions of the present document, hybrid radio provisions have been added to allow a seamless experience for users when consuming radio services delivered by digital radio broadcasting systems (DAB, DRM) or IP or a combination of both. The use of the present document allows content to be created once by the service provider for delivery by both mechanisms and allows manufacturers to implement devices with many common elements

ETSI TS 102 427 V1.1.1 (2005-07): Digital Audio Broadcasting (DAB); Data Broadcasting - MPEG-2 TS streaming. The present document specifies how MPEG 2 Transport Stream can be encapsulated within a DAB sub-channel including additional error protection mechanisms

ETSI TS 102 428 V1.2.1. (2009-04): Digital Audio Broadcasting (DAB); DMB video service; User Application Specification
The present document specifies the user application for video services carried via DAB. It also includes profile definitions for the application

ETSI TS 102 563 V1.2.1 (2010-05): Digital Audio Broadcasting (DAB); Transport of Advanced Audio Coding (AAC) audio. The present document defines the method to code and transmit audio services using the HE AAC v2 [2] audio coder for Eureka-147 Digital Audio Broadcasting (DAB) (EN 300 401 [1]) and details the necessary mandatory requirements for decoders. The permitted audio modes and the data protection and encapsulation are detailed. This audio coding scheme permits the full use of the PAD channel for carrying dynamic labels and user applications

ETSI TS 102 632 V1.1.1 (2008-11): Digital Audio Broadcasting (DAB); Voice Applications. This document describes Voice Applications specification. To begin with, the VoiceXML profile is explained with details about the modularization of VoiceXML 2.0, the dialog constructs, the user input, the system output, the control flow and scripting and the environment and resources. Then, the synchronization management mechanism is explained, followed by the specification of the extended interfaces. Finally, the transport and signalling of Voice Applications are detailed

ETSI TS 102 635-1 V1.1.1 (2009-08): Digital Audio Broadcasting (DAB); Middleware; Part 1: System aspects: this document establishes a standard for a platform-independent environment, where executable applications can be signalled and transferred to a receiver via a broadcasting network and executed on the receiver. It does not suppose the exclusive use of a specific broadcast network but defines the commonly-required specifications among diverse broadcast networks. It includes the definitions of basic data formats, protocols to deliver data, to signal downloadable applications and to download them, ways to denote resources on broadcast networks, and detailed interfaces among receiver platform, broadcast and communication networks, and the applications

ETSI TS 102 635-2 V1.1.1 (2009-08): Digital Audio Broadcasting (DAB); Middleware; Part 2: DAB. This document specifies the additional definitions to apply MATE middleware to Eureka-147 Digital Audio Broadcasting (DAB) (EN 300 401 [9]). Within the present document the term "DAB" is used to refer to the Eureka-147 Digital Audio Broadcasting standard

ETSI TS 102 652 V1.1.1 (2007-10): Digital Audio Broadcasting (DAB); Intellitext; Application specification. This document describes the Intellitext DL extension, including structure and formatting of data and receiver and broadcast requirements. It also covers backwards compatibility with earlier versions of Intellitext

ETSI TS 102 693 V1.1.2 (2009-11): Digital Audio Broadcasting (DAB); Encapsulation of DAB Interfaces (EDI). This document provides a mechanism for the encapsulation of STI-D (see EN 300 797 [4]) and ETI (see ETS 300 799 [5]) compliant data streams for distribution over

IP networks. EDI is based on the existing Distribution and Communications Protocol (DCP - TS 102 821 [2]), and therefore a layered approach relevant to unique IP network designs can be implemented. An EDI Packet represents a single STI-D or ETI 24 ms logical frame. In order to maximize efficiency across the IP network, unnecessary LI data (i.e. data formatted according to the STI-D or ETI "logical interface"), which can be reliably reproduced at the receiver is removed. The TAG Items are grouped to form a single EDI Packet, and passed onto DCP for Application Framing (AF)

ETSI TS 102 818 V1.4.1 (2008-06): Digital Audio Broadcasting (DAB); Digital Radio Mondiale (DRM); XML Specification for DAB Electronic Programme Guide (EPG). This paper defines the XML Document Type Definitions (DTDs) for an Electronic Programme Guide (EPG) for Digital Audio Broadcasting (DAB)

ETSI TS 102 978 V1.1.1 (2008-07): Digital Audio Broadcasting (DAB); Encapsulation of DAB Interfaces (EDI). This document provides a mechanism for the encapsulation of STI-D (see EN 300 797 [4]) and ETI (see ETS 300 799 [5]) compliant data streams for distribution over IP networks. EDI is based on the existing Distribution and Communications Protocol (DCP - TS 102 821 [2]), and therefore a layered approach relevant to unique IP network designs can be implemented. An EDI Packet represents a single STI-D or ETI 24 ms logical frame. In order to maximize efficiency across the IP network, unnecessary LI data (i.e. data formatted according to the STI-D or ETI "logical interface"), which can be reliably reproduced at the receiver is removed. The TAG Items are grouped to form a single EDI Packet, and passed onto DCP for Application Framing (AF)

ETSI TS 102 979 V1.1.1 (2008-06): Digital Audio Broadcasting (DAB); Journaline; User application specification. This document is to describe and define the XML based low profile information service "Journaline®"

ETSI TS 103 176 V1.1.2 (2013-07): Digital Audio Broadcasting (DAB); Rules of implementation; Service information features
This document defines rules of implementation for certain service information features. These rules have been developed to provide a reliable and consistent experience for digital radio listeners; they provide implementation details for how the FIC signalling is used and how receivers will interpret and behave in response to receiving the FIC signalling. The rules defined in the present document supersede the informative guidance given in TR 101 496 [i.1] for the FIGs contained herein. In addition, some clarifications are provided for EN 300 401 [1] where a number of interpretations may appear equally valid: in each case this is mentioned specifically. Future versions of EN 300 401 [1] will be modified to include these clarifications

ETSI TS 103 177 V1.1.1 (2013-08): Digital Audio Broadcasting (DAB); Filecasting; User application specification. This document specifies the

Filecasting user application which permits the non-linear delivery of multimedia content using DAB. Whilst the main focus of the present document is the delivery of audio files over a broadcast network, it is also applicable to other media formats too, such as video files and documents which may contain a mixture of formatted text and graphics, for example in pdf format

Important Note: The revision numbers of the documents given in the approval standard are the minimum standards that apply. Should updated versions of these documents be published, the latest version will always apply. This also applies to documents where no revision number is currently quoted

Additional Requirements

Additional requirements exist for the use of T-DAB Broadcast services at this time. A licence must be obtained before equipment of this type can be used in Botswana. This licence will detail conditions of use and any additional requirements which must be met

Obtaining Technical Standards

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CENELEC, IEC and CISPR standards may be obtained at cost from, or through www.cenelec.org and from www.iec.ch respectively