

Australian Standard[®]

**Digital television—Requirements for
receivers**

**Part 1: VHF/UHF DVB-T television
broadcasts**



This Australian Standard® was prepared by Committee CT-002, Broadcasting the Related Services. It was approved on behalf of the Council of Standards Australia on 30 March 2010. This Standard was published on 23 June 2010.

The following are represented on Committee CT-002:

- Australian Broadcasting Corporation
- Australian Chamber of Commerce and Industry
- Australian Communications and Media Authority
- Australian Industry Group
- Australian Information Industry Association
- Australian Subscription Television and Radio Association
- CHOICE
- Commercial Radio Australia
- Community Broadcasting Association of Australia
- Consumer Electronics Suppliers Association
- Dept of the Environment, Water, Heritage and the Arts
- Electronic Services Industry Association
- Engineers Australia
- Free TV Australia
- Media Access Australia
- Special Broadcasting Service

Additional Interests:

- Australian Digital Testing
 - AV Link Australia
 - BTC Australia
 - Foxtel Management
 - LG Electronics
 - Matchmaster Communications
 - Modern Antenna Systems
 - NetworkTen
 - Panasonic Australia
 - Seven Network (Operations)
 - Sony (Australia)
-

This Standard was issued in draft form for comment as DR 09019.

Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through the public comment period.

Keeping Standards up-to-date

Australian Standards® are living documents that reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued.

Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments that may have been published since the Standard was published.

Detailed information about Australian Standards, drafts, amendments and new projects can be found by visiting www.standards.org.au

Standards Australia welcomes suggestions for improvements, and encourages readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at mail@standards.org.au, or write to Standards Australia, GPO Box 476, Sydney, NSW 2001.

Australian Standard[®]

Digital television—Requirements for receivers

Part 1: VHF/UHF DVB-T television broadcasts

Originated as AS 4933.1—2000.
Second edition 2005.
Third edition 2010.

COPYRIGHT

© Standards Australia

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher.

Published by Standards Australia GPO Box 476, Sydney, NSW 2001, Australia
ISBN 978 0 7337 9617 3

PREFACE

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee CT-002, Broadcasting and Related Services, to supersede AS 4933.1—2005. After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this Standard is to provide television receiver manufacturers with the technical specifications and requirements relating to digital television receivers intended to be used in Australia to receive and decode free-to-air DTTB transmissions that comply with the Australian DTTB transmission Standard AS 4599.1—2007, *Digital television—Terrestrial broadcasting—Characteristics of digital terrestrial television transmissions*.

This Standard does not specify the final presentation characteristics of picture (display) and sound or associated services.

Interoperability issues for DVB-S, DVB-C and datacasting are not addressed in this part of the Standard.

The terms ‘normative’ and ‘informative’ are used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance. Informative sections are also included in the main body of this Standard.

CONTENTS

	<i>Page</i>
FOREWORD.....	4
SECTION 1 SCOPE AND GENERAL	
1.1 SCOPE	5
1.2 APPLICATION	6
1.3 REFERENCED DOCUMENTS	6
1.4 DEFINITIONS	6
SECTION 2 MINIMUM REQUIREMENTS FOR RECEIVERS.....	7
SECTION 3 RECEIVER FEATURES—REQUIREMENTS AND APPLICABILITY	
3.1 REQUIREMENTS AND OTHER FEATURES.....	11
3.2 POWER-ON OPERATIONS	14
3.3 USER OPERATION.....	15
3.4 RF PERFORMANCE, COFDM DEMODULATION AND CHANNEL DECODING	22
3.5 MULTIPLEX AND TRANSPORT STREAM.....	25
3.6 PROCESSING PROGRAM-SPECIFIC INFORMATION (PSI) AND SERVICE INFORMATION (SI)	26
3.7 VIDEO DECODE AND DISPLAY	30
3.8 AUDIO—DECODING AND REPRODUCTION.....	37
3.9 OPERATING SOFTWARE AND MIDDLEWARE APPLICATION PROGRAMMING INTERFACE (API).....	43
3.10 INTERACTIVITY AND ON-SCREEN DISPLAY	44
3.11 DATA BROADCASTING (BROADCAST TELEVISION RELATED).....	47
3.14 CONTENT PROTECTION AND COPY MANAGEMENT (CPCM)	49
3.15 INTERFACES AND CONNECTORS.....	50
3.16 RETURN CHANNEL (RC) PATH.....	54
3.17 SYSTEM SOFTWARE UPDATE	55
APPENDICES	
A LIST OF REFERENCED DOCUMENTS	56
B SPECIFICATIONS FOR RF PERFORMANCE OF DVB-T RECEIVERS.....	60
C RECEPTION QUALITY OSD METER	70
D AUSTRALIAN DIGITAL TELEVISION BROADCAST BAND FREQUENCIES	72
E AUSTRALIAN BROADCAST AND NON-BROADCAST BAND CHANNEL FREQUENCIES.....	73
F AUSTRALIAN PARENTAL GUIDANCE CODES.....	75
G TELETEXT BASED CLOSED CAPTIONS IN SD AND HD PROGRAMS	77
H 50 Hz HD AND SD PICTURE TIMINGS AND SCAN RATES.....	80
I FUNCTIONAL DESIGN ISSUES OF SPECIAL NOTE FOR MANUFACTURERS OF DTTB RECEIVERS INTENDED FOR USE IN AUSTRALIA.....	84
J ABBREVIATIONS AND GLOSSARY	92

FOREWORD

Digital Terrestrial Television Broadcasting (DTTB) officially began in Australia on 1 January 2001. The transmissions are based on the DVB-T* system; however, it should be noted that the international DVB Standards and related ETSI, IEC/ISO and ITU-R documents provide for a range of operational systems.

Many other digital television systems around the world are based on pay satellite and cable systems. In such cases the compatibility of the transmission and reception equipment within each system is generally under the control of a single system operator. These are known as ‘vertical’ markets.

In Australia, in contrast, the digital terrestrial television broadcasting system is not under the control of a single operator. Rather, there are multiple free-to-air services, and domestic digital television receiver/decoders produced by many different manufacturers are available through a wide range of retail outlets. This is known as a ‘retail’ or ‘horizontal’ market.

Consumers in Australia expect to have access to a wide choice of receiving equipment, ranging from fully integrated receivers with inbuilt displays to modular set-top-box receivers designed to be connected to a separate display and sound reproduction system. In addition, the various broadcasters in Australia use different brands of encoding and transmission equipment. Manufacturers who are supplying the Australian market are obliged, therefore, to ensure that their equipment will operate satisfactorily under the relevant Australian conditions.

This Standard aims to assist manufacturers by providing the information necessary for them to ensure that any digital terrestrial television receiving equipment made for the Australian system will operate satisfactorily to receive Australian digital terrestrial television broadcast transmissions.

A separate Australian Standard, AS 4599.1, provides information specific to the transmission aspects of the Australian adaptation of the relevant ETSI/DVB-T Standards. For an historical overview of DVB documents, the reader is referred to the technical report in ETSI TR 101 200, *Digital Video Broadcasting (DVB); A guideline for the use of DVB specifications and standards*.

Some receiver features are defined in this document as essential; that is, their inclusion is mandatory. Without them, the equipment will not comply with this Standard. Whether features nominated as recommended are included will be a marketing decision by the manufacturer, but some optional features, if provided, are subject to certain requirements. These requirements, too, are detailed in this Standard.

Section 2 provides a summary of the minimum requirements for DTTB receivers intended for use in the Australian environment.

Manufacturers should note that, because DTTB is a rapidly evolving technological environment, this Standard may require revisions and additions from time to time. Readers are urged to contact any Standards Australia office or Australian broadcasters regarding such changes.

* DVB-T: Digital Video Broadcasting (Project)—Terrestrial. The DVB Project office is located at the headquarters of the European Broadcasting Union in Geneva, Switzerland. Its website is: <http://www.dvb.org/>

STANDARDS AUSTRALIA

Australian Standard Digital television—Requirements for receivers

Part 1: VHF/UHF DVB-T television broadcasts

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies the requirements for equipment such as set-top-boxes, integrated receiver-displays and PVRs intended to be used in Australia for the reception of free-to-air (FTA) terrestrial DVB-T broadcast television and access to the program services offered.

In addition, it sets out a number of optional features that manufacturers may provide in such equipment, indicating which features are recommended and which features, if provided, must meet certain requirements in order to operate satisfactorily in the Australian environment.

This Standard is based on the ETSI/DVB-T suite of Standards, and defines requirements for both Standard Definition (SD) and High Definition (HD) receivers.

The requirements for digital television receivers set out in this Standard are consistent with the relevant Australian broadcast regulatory requirements. The international DVB Standards and related ETSI, IEC/ISO and ITU-R documents provide for various implementation systems. This Standard specifies the choices available in Australia and references Australian adaptations of these international Standards where appropriate.

Section 2 sets out the minimum requirements for receivers if they are to operate satisfactorily in the Australian environment to receive Australian FTA terrestrial DVB-T broadcasts.

Section 3 provides a comprehensive list of receiver specifications and features, indicating whether they are essential or optional, and if optional, whether they are recommended or subject to certain requirements, or both. The optional features referred to in this Standard include interactive middleware and audio decoding choices such as surround and multilingual sound, as well as interfaces for ancillary equipment.

This Standard does not specify the final presentation characteristics of picture (display) and sound or associated services.

This Standard does not cover the requirements for subscription television receivers. Specifications for subscription/pay services should be obtained from the operators of those services.

Attention is drawn to the following appendices:

- (a) *Appendix B* (normative), which details requirements and measurement methods for the RF performance of the receiver's tuner.
- (b) *Appendix I* (informative), which provides guidance on issues related to the functional design of receivers that have attracted attention since the start of DVB-T transmissions.
- (c) *Appendix J* (informative), which provides a list of abbreviations and a glossary of terms used in this Standard.