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Broadcasting Equipment Technical Standard

Technical Standards and Requirements for Apparatus Capable of Receiving Television Broadcasting Signals

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Canada

Preface

Broadcasting Equipment Technical Standard No. 7 (BETS-7) establishes the technical standards as well as the technical and administrative requirements for apparatus capable of receiving television broadcasting signals. These apparatus are equipped with a National Television System Committee (NTSC) tuner and/or one or multiple Advanced Television Systems Committee (ATSC) tuners for the reception of television broadcasting signals.

The following are the main changes:

1. **updated** to the current version of applicable technical standards and associated changes;
2. **added** requirements for apparatus equipped with an ATSC 3.0 tuner;
3. **updated** the testing and labelling to the latest Self-Declaration of Compliance (SDoC) associated with Category II equipment;
4. **made** editorial changes and clarifications, as appropriate.

Issued under the authority of
the Minister of Innovation, Science and Industry

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1 Scope

Broadcasting Equipment Technical Standard No. 7 (BETS-7) applies to all apparatus capable of receiving television broadcasting signals that are manufactured, imported, distributed, leased, offered for sale, or sold in Canada. These apparatus are equipped with a National Television System Committee (NTSC) tuner and/or one or multiple Advanced Television Systems Committee (ATSC) tuners for the reception of television broadcasting signals. These apparatus are televisions (TVs) and TV interface devices.

2 Coming into force and transition period

This document will come into force upon its publication on the [website](#) of Innovation, Science and Economic Development Canada (ISED). However, a transition period of six (6) months following its publication will be provided, within which compliance with BETS-7, issue 3 or BETS-7, issue 4, will be accepted.

After this transition period, all apparatus subject to this standard that continue to be manufactured, imported, distributed, leased, offered for sale, or sold in Canada shall comply with BETS-7, issue 4.

A copy of BETS-7, issue 3, may be requested by [email](#).

3 Definitions

This section outlines the definitions of terms used in this document.

Advanced Television Systems Committee (ATSC): The committee developing standards for the production and distribution of digital television broadcasting signals.

Analog and Digital Television Receiving Apparatus: A receiver that is equipped with an NTSC tuner for the reception of analog television broadcasting signals, as well as one or multiple ATSC tuners for the reception of digital television broadcasting signals. Based on its design purpose, the apparatus could either be unequipped with a built-in display (i.e., a TV interface device) or be equipped with a built-in-display (i.e., a TV).

Cable-Compatible Analog and Digital Television Receiving Apparatus: A receiver that is equipped with an NTSC tuner for the reception of analog television broadcasting signals, one or multiple ATSC tuners for the reception of digital television broadcasting signals, as well as a coaxial input terminal allowing the reception of cable television signals. Based on its design purpose, the apparatus could either be unequipped with a built-in display (i.e., a TV interface device) or be equipped with a built-in-display (i.e., a TV).

Cable-specific channels: All channels in the Very High Frequency (VHF) and Ultra High Frequency (UHF) bands that are authorized by ISED for the cable television service.

Digital Television Receiving Apparatus: A receiver that is equipped with one or multiple ATSC tuners for the reception of digital television broadcasting signals. Based on its design purpose, the apparatus could either be unequipped with a built-in display (i.e., a TV interface device) or be equipped with a built-in-display (i.e., a TV).

National Television System Committee (NTSC): The committee that developed standards for the production and distribution of analog television broadcasting signals. Refer to the document titled [BTS-3, Broadcasting Transmission Standard: Television Broadcasting](#), for the standards governing analog television broadcasting systems in Canada.

Over-the-air television channels: All channels in the VHF and UHF frequencies authorized by ISED for the television broadcasting service.

[Editor’s note: Comments are sought from the RABC on whether or not to specify the channel range for the reception of analog and digital television broadcasting signals.]

Spurious emission: An undesired emission on a particular frequency or a range of frequencies that is/are outside the necessary bandwidth of the desired channel.

4 References to technical standards

This section outlines the normative and informative references to technical standards that are related to this document.

4.1 Normative references

The current issues of the following documents are applicable. Those published by ISED are available on the [Spectrum management and telecommunications](#) website, under [Published documents](#).

ATSC A/53	<u>ATSC Digital Television Standard, Parts 1-6, 2007</u> , January 2007
ATSC A/65	<u>ATSC Standard: Program and System Information Protocol for Terrestrial Broadcast and Cable</u> , August 2013
ATSC A/300	<u>ATSC Standard: ATSC 3.0 System</u> , April 2022
BTS-3	<u>Broadcasting Transmission Standard: Television Broadcasting</u> , December 1997
CTA-23-B	<u>CTA Standard: Measurement Procedures for Determining Compliance with FCC Rules for “Cable-Ready Consumer Electronics Equipment”</u> , April 2019
CTA-542-D	<u>CTA Standard: Cable Television Channel Identification Plan</u> , June 2013 (revision 2018)

- ICES-003 [Information Technology Equipment \(Including Digital Apparatus\)](#), October 2020
- IEEE 187 [IEEE Standard for Measurement of Emissions from FM and Television Broadcast Receivers in the Frequency Range of 9 kHz to 40 GHz](#), May 2018
- ITU-R
Recommendation
BT.471-1 [Nomenclature and description of colour bar signals](#), July 1986

4.2 Informative references

The current issues of the following documents are applicable.

- ATSC A/69 [ATSC Recommended Practice: Program and System Information Protocol Implementation Guidelines for Broadcasters](#), December 2009
- ATSC A/331 [ATSC Standard: Signaling, Delivery, Synchronization, and Error Protection](#), March 2022
- ATSC A/332 [ATSC Standard: Service Announcement](#), March 2022

ATSC – Advanced Television System Committee
BTS – Broadcasting Transmission Standard
CTA – Consumer Technology Association
IEEE – Institute of Electrical and Electronics Engineers
ICES – Interference-Causing Equipment Standard
ITU – International Telecommunication Union

5 Self-Declaration of Compliance (SDoC)

An apparatus covered by this standard is classified as Category II equipment. Pursuant to subsection 21(5) of the [Radiocommunication Regulations](#), Category II equipment is exempt from certification and registration and thus it is not required to have a technical acceptance certificate (TAC) issued by the Certification and Engineering Bureau (CEB) of ISED or a certificate issued by an ISED-recognized certification body (CB).

However, if the apparatus contains Category I radio modules (e.g., for radiocommunication other than broadcasting), each radio module within the apparatus shall be certified or the entire apparatus (host with radio modules integrated) shall be certified; see [RSS-GEN](#) and [RSP-100](#).

Pursuant to subsection 4(3) of the [Radiocommunication Act](#), the person or entity that manufactures, imports, distributes, leases, offers for sale or sells a Category II equipment in

Canada is responsible for the compliance of this equipment with all applicable ISED standards. The SDoC is the conformity assessment scheme used for Category II broadcasting equipment.

The responsible party tests the Category II equipment and ensures that it meets the appropriate technical standards. Category II equipment testing does not have to be performed by an ISED recognized testing laboratory. The responsible party also labels the equipment and fulfils any other administrative requirements as required by the standards (e.g., test report retention). The label placed on each unit of the equipment model, according to the applicable ISED standard, represents the responsible party's SDoC with ISED requirements.

Refer to the [Telecommunications Equipment Regulatory Process](#) website (section 3, [Conformity assessment schemes](#)) for more information on SDoCs.

6 Technical requirements

This section defines the technical requirements applicable for apparatus subject to BETS-7 standard.

6.1 General

This section specifies the general requirements for apparatus subject to BETS-7.

6.1.1 Tuner requirements

Every apparatus shall be equipped with an ATSC 1.0 tuner. The apparatus may also be equipped with an NTSC tuner and/or one or multiple ATSC 3.0 tuners.

6.1.2 Channel selection

Every (NTSC/ATSC) tuner within an apparatus shall be able to receive television broadcasting signals on over-the-air television channels.

Apparatus able to connect to a cable distribution undertaking shall be able to receive cable television signals on cable-specific channels as defined in the standard [CTA-542-D](#).

6.1.3 Noise figure

This requirement does not apply to the portion of the apparatus that provides for the reception of digital television signals, it only applies to an apparatus equipped with a NTSC tuner.

The noise figure shall not exceed 14 dB for any UHF television channel. If a tuner has a built-in splitter, a relaxation of 4 dB shall be applied to this limit.

6.1.4 Radiated emissions

The electrical field strength of radiated emissions produced by the apparatus shall not exceed

the Class B limits specified in the standard [ICES-003](#). The highest frequency of measurement shall only be determined based on the signals used in or by every (NTSC/ATSC) tuner integrated in the apparatus.

For measurements related to an NTSC tuner, the apparatus shall be fed a standard television colour bar signal in accordance with the International Telecommunication Union's (ITU) recommendation [ITU-R Recommendation BT.471-1](#).

The measurement shall be performed in accordance with the standard from the Institute of Electrical and Electronics Engineers (IEEE), [IEEE 187](#), in particular, section 7 (where it applies to television broadcast receivers).

6.2 Reception of Digital Television (DTV)

This section specifies the additional requirements for the reception of digital television signals.

6.2.1 Decoder for ATSC 1.0

The apparatus shall be capable of receiving and presenting for display (either through a built-in display, for a TV, or through an external device, for a TV interface device) program material that has been encoded in any of the video formats supported by the [ATSC A/53](#) standard.

6.2.2 Decoder for ATSC 3.0

The apparatus shall be capable of receiving and presenting for display (either through a built-in display, for a TV, or through an external device, for a TV interface device) program material that has been encoded in any of the video formats supported by the [ATSC A/300](#) standard.

6.2.3 Channel and Program Information for ATSC 1.0

The apparatus shall process and display (either through a built-in display, for a TV, or through an external device, for a TV interface device) the program and system information protocol (PSIP) data in accordance with the [ATSC A/65](#) standard to provide the user with tuned channel and program information.

For further guidance, refer to the [ATSC A/69](#) recommended practice.

6.2.4 Channel and Program Information for ATSC 3.0

The apparatus shall process and display (either through a built-in display, for a TV, or through an external device, for a TV interface device) the internet protocol (IP) data to provide the user with tuned channel and program information. For further guidance, refer to the [ATSC A/331](#) and [ATSC A/332](#) standards.

6.3 Cable-compatible analog and digital television receiving apparatus

This section specifies the additional requirements for cable-compatible analog and digital

television receiving apparatus.

6.3.1 General

The requirements in this section (6.3) apply specifically to the analog portion of the said apparatus.

6.3.2 Cable input conducted emissions

When the apparatus is connected to a cable distribution undertaking, the level of any NTSC spurious emission signal generated within the apparatus and arriving at the cable input terminals of the apparatus shall not exceed:

- (a) -26 dBmV from 54 MHz up to and including 300 MHz;
- (b) -20 dBmV from 300 MHz up to and including 450 MHz;
- (c) -15 dBmV from 450 MHz up to and including 804 MHz.

Refer to the standard of the Consumer Technology Association [CTA-23-B](#) (formerly CEA-23-B), in section 4.1, *Cable Input Conducted Emissions*, for further details on the test conditions, calibration and measurement procedures.

6.3.3 Adjacent channel interference

When in the presence of a continuous wave signal without modulation (CW) in a lower adjacent channel, set at 1.5 MHz below the visual carrier frequency of the desired signal, spurious emission signals within the intermediate frequency (IF) passband shall be attenuated at least 55 dB below the visual carrier of the desired signal.

Refer to the standard [CTA-23-B](#), in section 5.4, *Lower Adjacent Channel Performance*, for the test conditions, calibration and measurement procedures.

6.3.4 Direct pickup interference

The immunity requirements of the receiving apparatus are given by the ratio of the desired to the undesired co-channel interfering ambient field at the intermediate frequency (IF) passband. The ratio shall be at least 45 dB. The average ratio over the six channels tested shall be at least 50 dB.

Refer to the standard [CTA-23-B](#), in section 5.1, *Immunity of Subscriber Equipment to Co-channel Direct Pick-up*, for the test conditions, calibration and measurement procedures.

6.3.5 Impedance

The signal input shall be through a 75 ohm impedance coaxial connection.

6.3.6 Receiver overload

When the receiving apparatus is subject to strong over-the-air signals, the spurious emission signals present within the intermediate frequency (IF) passband shall be attenuated as follows:

- (a) at least 55 dB below the visual carrier of the desired channel from 54 MHz to 550 MHz; and
- (b) at least 51 dB below the visual carrier of the desired channel from 550 MHz to 804 MHz.

Refer to the standard [CTA-23-B](#), in section 5.3, *Tuner Overload Performance*, for the test conditions, calibration and measurement procedures.

6.3.7 Image channel interference

The interference experienced by the receiving apparatus when tuned to a specific channel in the presence of another television signal located 90 MHz above the visual carrier of the tuned channel is referred to as image channel interference.

Any signal causing image channel interference shall be attenuated by at least 60 dB when the apparatus is tuned on channels from 54 MHz to 714 MHz (inclusive), and by at least 50 dB when the apparatus is tuned on channels from 714 MHz to 804 MHz.

Refer to the standard [CTA-23-B](#), in section 5.2, *Image Rejection*, for the test conditions, calibration and measurement procedures.

7 Administrative requirements

This section defines the administrative requirements applicable to equipment subject to this standard.

7.1 Equipment used for demonstration or research purposes

This section specifies the administrative requirements applicable to equipment subject to demonstration or research purposes.

7.1.1 General

Equipment under the scope of this standard used solely for purposes of research and development, experimentation, demonstration, or assessment of marketability, is exempt from the requirement to demonstrate compliance with this standard. Such equipment shall not be leased, sold, or offered for sale in Canada, nor shall it be distributed with the intention to be leased, sold, or offered for sale in Canada.

Note: Equipment that is offered free of charge is still subject to this standard since such equipment is still subjected to the “manufacture”, “importation”, or “distribution” activities, all of which are listed in section 4 of the *Radiocommunication Act* (see [section 5](#) of this document).

7.1.2 Labelling requirements

Equipment under the scope of this standard used solely for purposes of research and development, experimentation, demonstration or assessment of marketability shall be labelled and its shipping documentation shall be accompanied by the following declaration, in both English and French (e-labelling is not allowed in this case):

- a) Marking on the unit itself:

"Demo unit. Not to be leased, sold or offered for sale in Canada.

Matériel de démonstration. Ne doit pas être loué, vendu ou mis en vente au Canada."

- b) Declaration accompanying the unit:

"This equipment is a prototype unit which is intended for purposes of research and development, experimentation, demonstration or assessment of marketability. It cannot be leased, sold, or offered for sale in Canada.

Ce matériel est un prototype destiné à la recherche et au développement, à l'expérimentation, à la démonstration ou à l'évaluation de son potentiel commercial. Il ne peut être loué, vendu ou mis en vente au Canada."

7.2 Test report

The test report shall comply with all requirements set out in this document, including those stated in Annex A where applicable.

The responsible party shall retain a copy of the test report for as long as the apparatus is manufactured, imported, distributed, leased, offered for sale, or sold in Canada. The responsible party shall make the test report available to ISED upon request.

In case a new issue of BETS-7 is published and the apparatus continues to be manufactured, imported, distributed, leased, offered for sale, or sold in Canada after the stated transition period expires, the responsible party shall update the test report with additional test results or an engineering analysis, as necessary, such that the test report demonstrates compliance with the requirements of the new issue of BETS-7.

7.3 Labelling

The responsible party shall ensure that each unit of an apparatus model bears a permanent label or marking containing the statement below (in English and French). This label shall be permanently affixed to each unit or displayed electronically and its text shall be indelible and

clearly legible.

The label shall contain the following statement:

CAN BETS-7 / NMTR-7

For apparatus with an integral (non-removable) display screen, an electronic label (e-label) may be used in lieu of a physical label to fulfill the above requirements. Additional instructions on using e-labels are provided in the annex A of this document.

Equipment which is not labelled in accordance with this section is not considered to have met the technical standards as well as the technical and administrative requirements of this document.

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Annex A(normative) — Electronic labelling (e-labelling)

A1. General

Instead of a physical label on the device itself, ISED allows devices with an integrated display screen to present the required label information electronically (e-label). Devices without an integrated display screen are allowed to present the e-labelling information through an audio message or a host equipment display screen, where such a host equipment is connected via a physical connection, Bluetooth, Wi-Fi, etc., if this connection to a host equipment that incorporates a display is mandatory for use.

Where this annex requires information to be provided on the packaging, this must be on the exterior of the product packaging and shall not be provided electronically.

A2. Information to be displayed

The e-label shall display the information required in [section 7.3](#) of this document.

A3. Accessibility

This section specifies the accessibility requirements.

A3.1. Instructions to access the label

Users shall be provided clear instructions on how to access the regulatory information stored electronically (e-label). These instructions shall meet the following requirements:

- a. be provided in the user manual, operating instructions or packaging material (e.g., on the bags used to pack the device or on accompanying leaflets), or on a website related to the product; in the latter case, instructions on how to access the specific webpage shall be provided on the packaging or in accompanying leaflets;
- b. the test report shall include the instructions for accessing information as part of the label exhibit (i.e., in the section of the test report demonstrating compliance with the labelling requirements).

A3.2. Accessibility to the label

The e-label shall meet the following requirements:

- a. accessing the e-label shall not require the use of special access codes (other than the user login credentials to access the product's controls, where applicable) or accessories;
- b. accessing the e-label shall not require more than three steps from the device's main menu; and

- c. the e-label shall not be modifiable by the user (e.g., if stored in the firmware or software menus).

A4. Labelling for importation and purchasing

Products utilizing e-labels shall have a physical label on the product packaging at the time of importation, offering for sale and sale. The following conditions shall apply:

- a. For devices imported in bulk (not packaged individually), a removable adhesive label or, for devices in protective bags, a label on the bags is acceptable to meet the physical label requirement.
- b. Any removable label shall survive normal shipping and handling and may only be removed by the end user, after purchase. For devices already imported in individual packages ready for sale, the information may alternatively be provided on the package.

A5. Security

The information to be displayed on the e-label, as specified in [section A2](#), shall meet the following security requirements:

- a. be programmed by the responsible party (e.g., manufacturer); and
- b. not be modifiable or removable during the course of normal authorized activities by a third-party (i.e., the typical user), such as installation of applications or accessing the menus.