Republic of the Philippines
NATIONAL TELECOMMUNICATIONS COMMISSION
NTC Bldg., BIR Road, East Triangle, Diliman, Quezon City

MEMORANDUM CIRCULAR
No. 07-12-2014

Subject: Rules and Regulations for Digital Terrestrial Television (DTT) Broadcast Service

Whereas, pursuant to Executive Order (E.O.) No. 546, Series of 1979, the National Telecommunications Commission (NTC) is vested with the power to promulgate rules and regulations as public safety and interest may require, to encourage a large and more effective use of communications, radio and television broadcasting facilities and to maintain effective competition among private entities;

Whereas, in order to keep pace with the development in technology, the introduction of digital technology in the broadcasting service would ensure the competitiveness of the broadcast industry and afford it the opportunity to provide enhanced services to better serve the public;

Whereas, in order to facilitate the entry of digital broadcast services in the country, there is a need to provide the corresponding guidelines for the delivery of digital television services and ensure smooth transition from analog to digital television;

Now therefore, the NTC, pursuant to Act No. 3846, the Radio Control Law (as amended) and Executive Order 546 series of 1979, hereby issues the following rules and regulations on the introduction of the Digital Terrestrial Television Broadcast (DTTB) service:

Section 1. Definition of Terms

Section 1.1. Digital Terrestrial Television Broadcasting (DTTB) – An implementation of the digital technology in the television service intended to provide a greater number of Standard Definition Television (SDTV) channels and/or better quality of picture (e.g. HDTV) and sound (e.g. AAC, EAC3, Dolby Digital) through a conventional aerial antenna instead of a satellite or cable connection. It also pertains to Digital Terrestrial Television (DTT).

Section 1.2. Integrated Services Digital Broadcast Terrestrial (ISDB-T) – A flexible digital television (DTV) transmission system that is capable of providing three (3) levels of hierarchical modulation that can carry audio, video and data services to fixed, mobile and handheld terminals using a single transmission facility with an integrated Emergency Warning Broadcast System (EWBS).

Section 1.3. Standard Definition TV (SDTV) – A television broadcasting system that has a resolution of 480 lines per frame.

Section 1.4. High Definition TV (HDTV) – A television broadcasting system with a resolution higher than 480 lines per frame.

Section 1.5. Digital Terrestrial Television Broadcasting (DTTB) Service – The service or set of services provided by a television broadcast service provider using digital technology, whether fixed or mobile which may include, but are not limited to, television broadcast services, audio broadcast services, data broadcast services and such other services as may become available in the future.

Section 1.6. Single Frequency Network (SFN) – A transmission scheme where several broadcast transmitters simultaneously send the same signal content/program over the same 6 MHz frequency channel over an approved service area.

Section 1.7. Emergency Warning Broadcast System (EWBS) – A system in DTTB service that shall be activated to alert and guide the public of an impending or ongoing emergency situation by delivering warning information through an audible sound and the superimposition of data to various types of ISDB-T receivers that are automatically activated.

Section 1.8. Duly Authorized Analog TV Operator – A duly enfranchised TV broadcast network in possession of a valid Provisional Authority (PA) or Certificate of Public Convenience (CPC) for VHF or UHF analog TV broadcast operations upon effectivity of this IRR.

Section 1.9. Data Broadcasting / Datacasting – A method of delivering Rich Text and graphics on the screen including the details and instructions from Emergency Warning Broadcast of an ISDB-T service.

Section 1.10. One-Seg – A mandated service in DTT for broadcasting to handheld and portable devices. Such service shall contain the free to air legacy program and the support for the display of Emergency Warning Broadcast information.

Section 1.11. Analog Shut-Off (ASO) – The date in the approved Migration Plan for the mandatory termination of all analog television services in the Philippines.

Section 1.12. Digital Switch On (DSO) – The date of effectivity of this Implementing Rules and Regulations (IRR).

Section 1.13. Transition Period – The period beginning with DSO until ASO.

Section 1.14. Service Area – The geographic area over which a Duly Authorized Analog TV operator is authorized to provide its broadcast services or the authorized service area approved for a new DTTB station.

Section 1.15. Broadcast Markup Language (BML) - A data-transmission markup language allowing text to be displayed on an ISDB-T enabled device.

Section 1.16. Middleware - A software layer located between the classical operating system (software that provides access to resources and devices) and the applications.

Section 2. General Provisions

Section 2.1. The ISDB-T standard shall be the sole standard in the delivery of DTTB services in the country.

Section 2.2. The provisioning of DTTB services shall be allowed upon effectivity of this IRR.

Section 2.2.a. The analog VHF-TV service shall neither be disrupted nor terminated until further orders or approval of the Commission.

Section 2.2.b. Duly authorized analog VHF TV operators shall be required to simulcast their DTTB service together with the analog TV service within one (1) year upon the grant of Authority to provide DTTB service, subject to the provisions of this IRR and other pertinent rules and regulations that the NTC may issue in the future. If any VHF TV operator is unable to simulcast, other qualified UHF TV operators may be allowed to use for their simulcast the frequency assigned to the VHF operator that is unable to simulcast, subject to Section 2.2.c.

Section 2.2.c. Analog UHF-TV operators may go directly to DTTB service anytime during the Transition Period using their assigned analog UHF-TV frequency, provided that a notice or advisory to the viewing public shall be given at least one month before the start of operations of the DTTB Service.

Analog UHF TV operators may also simulcast, subject to availability of frequencies, together with their analog TV service within one (1) year upon the grant of Authority to provide DTTB service. This is also subject to the provisions of this IRR and other pertinent rules and regulations that the NTC may issue in the future. The NTC shall issue the appropriate guidelines for the assignment of frequencies for such analog UHF TV operators.

Section 2.2.d. All DTTB stations shall provide a minimum of 51 dBμV/m rooftop (10 meters) reception for its approved service area.

Section 2.3. A duly authorized DTTB service provider shall have the option, manifested in its application to the NTC, to adopt either single or multi-program HDTV format or single or multi-program SDTV format, or any combination thereof, for its digital service. Any subsequent change in the program format that results in degradation or termination of an existing program shall require prior written approval from the NTC. In case of failure by the NTC to issue its decision within fifteen (15) days from the filing of an application for change or termination of format, the application shall be deemed approved.

Section 2.4. The provision of new programs in addition to the analog legacy program is encouraged. The provision of HD programs is likewise encouraged.

Section 2.5. UHF frequencies identified by the Commission, each with a bandwidth of 6 MHz, may be utilized for the provision of DTTB Service during the Transition period.

Section 2.6. Applications for DTTB Service by entities with no existing Authorization for analog TV service at the time of approval of the IRR shall not be granted during the transition period in Mega Manila which consists of Metro Manila including the Provinces of Bulacan, Pampanga, Cavite, Laguna and Rizal. Authorizations for new DTTB Service may be granted outside Mega Manila during the transition period subject to frequency availability in the area being applied for.

Section 2.7. The broadcasters chose Broadcast Markup Language (BML) to be used for the smooth implementation of the EWBS function.

Section 2.8. No analog TV service shall be allowed after ASO. The ASO shall be reviewed five (5) years after DSO in order to determine the extent to which the objective/targets of the Transition Plan, in relation to Section 5.6, have been achieved/satisfied.

Section 3. Qualification of Applicants for DTTB Service

The following Entities with a valid Congressional Franchise to provide a TV broadcasting service may apply for an authorization to operate a DTTB Service in their Franchise Area:

a. Existing Duly Authorized Analog TV Operators;
b. Entities with pending petitions for the issuance of authorizations to provide analog TV service desiring to amend their respective petitions for the issuance of authorizations to provide DTTB service; and
c. Entities with no existing petition for the issuance of an authorization for analog TV service.

No petitions or applications for new DTTB Service shall be granted by the NTC until all existing duly authorized analog operators have been granted their applications and assigned their DTT frequencies, subject to the provision of Section 4.2.

Section 4. Qualification Criteria and Petitions for DTTB Service

Section 4.1. Applicants intending to provide DTTB service shall possess the following minimum qualifications:

a. Holder of a Congressional Broadcast Franchise in the area applied for;
b. Must have the financial capacity to install, operate and maintain a DTTB service; and
c. Must prove that it has the technical capability to install, operate and maintain the proposed DTTB network.

Section 4.2. A duly authorized analog TV operator desiring to provide DTTB service shall file within sixty (60) days from effectivity of this IRR a Manifestation in the case/s pertaining to its analog TV Petition/s indicating its intention to convert its analog TV service to DTTB. Any duly authorized analog TV operator that fails to convert its analog TV service to DTT within the transition period shall result in the cancellation of its Authority/Permit and the automatic recall of its frequency assignment.

Section 4.3. Pending petitions for authorization to provide analog TV service may be amended by motion into a petition for authorization to provide DTTB Service. The petitioner shall comply with all the requirements of this IRR and prove its legal, technical, and financial capability to provide DTTB Service. Pending petitions for a new analog TV service which are not converted to a petition to provide DTTB Service within one hundred eighty (180) days from date of effectivity of this IRR shall be dismissed by the NTC.

Section 4.4. A duly enfranchised entity with no existing petition or application for issuance of an authorization to provide analog TV service that desires to provide DTTB Service shall file the requisite petition for each service area in which it intends to provide DTTB Service. The petitioner shall state its legal, technical and financial capability to provide such service; the type of DTTB services to be provided; and the schedule for providing said services; provided, that an applicant for DTTB shall provide at least one (1) free-to-air program.

Section 4.5. A separate petition shall be filed for each new or additional service area applied for.

Section 4.6. All pending petitions for the issuance of authorizations to provide DTTB Service shall be amended to comply with the requirements of this Memorandum Circular.

Section 4.7. Upon the effectivity of this IRR, petitions or applications for new authorization to install and operate new analog TV broadcast stations shall no longer be accepted by the Commission.

Section 5. Spectrum Allocation

Section 5.1. The frequency bands, 512-698 MHz (Channels 21 to 51) are hereby allocated for the implementation of the DTTB service.

Section 5.2. A bandwidth of 6 MHz shall be assigned for each authorized DTTB Service per service area.

Section 5.3. Where it is technically feasible, single frequency network (SFN) shall be allowed.

Section 5.4. The NTC shall take steps to provide the opportunity to UHF TV stations to simulcast by allocating frequencies that may become available.

Section 5.5. UHF TV stations shall be given equitable opportunity in the assignment of frequencies that may become available for simulcast after all VHF TV stations have been assigned their simulcast frequencies.

Section 5.6. The transition and migration from analog TV to DTTB Service shall be based on a Transition Plan formulated by the NTC in consultation with the broadcast industry. The Transition Plan shall specify the following:

a. The specific DTTB frequencies to be assigned to duly authorized analog VHF TV operators in each of their respective service areas;
b. The schedule for filing of applications for DTTB Service for the various categories of qualified applicants specified in Section 3; and
c. The period allowed for the construction of DTTB stations for the various categories of qualified applicants specified in Section 3.

Section 5.7. All analog TV Broadcast Transmissions shall be terminated on the ASO specified in the approved Migration Plan.

Section 6. Sale of TV Sets and Set-Top Boxes

Manufacturers and importers of brand new TV receiving sets shall indicate in each TV set whether the same can receive analog signal only and will require a set top box or whether the same can receive ISDB-T programs. Thus the following labels shall be used for television sets and set-top boxes:

a. ISDB-T ready STB;
b. Non-ISDB-T ready STB;
c. ISDB-T ready TV; and
d. Analog TV.

Section 7. All other standards specific to the Philippine DTTB system is hereto attached as Annex "A" of this IRR.

Section 8. Migration Plan

A DTTB Migration Plan shall be issued later by the government. The Migration Plan is a comprehensive plan that intends to address the policy, regulatory and technical issues as well as fiscal considerations, industry and consumer support interventions, and other measures necessary for the country's migration to Digital TV broadcasting, including the date of the planned ASO. The NTC shall issue the corresponding additional Rules and Regulations in accordance with the approved Migration Plan.

Section 9. Repealing Clause

Any Circular, Order or Memorandum or parts thereof inconsistent herewith are deemed superseded and/or amended accordingly.

Section 10. Effectivity

This Circular shall take effect fifteen (15) days after publication in a newspaper of general circulation and upon filing with the UP Law Center of three (3) certified copies of this IRR.

Quezon City, Philippines, 16 December 2014

GAMALIEL A. CORDOBA
Commissioner

DELILAH F. DELES
Deputy commissioner

CARLO JOSE A. MARTINEZ
Deputy Commissioner

ISDB-T Standards

1. Transmission

   While most of all the technical parameters related to transmission shall be in accordance with ABNT NBR 15601, there are some modifications necessary.

   The Philippines will not use the VHF band and UHF band higher than [51]ch for the digital terrestrial TV. Besides, the Philippines will use the CH-37 which is not used in Brazil as it is being utilized for radio astronomy. Thus it is necessary to modify the list of operating channels of the UHF band. See Annex 1 for details.

2. Video Coding

   All the technical parameters related to video coding shall be in accordance with ABNT NBR 15602-1. However video coding parameters for full-seg services are applied to any layers except for the partial reception layer.

3. Audio Coding

   All the technical parameters related to audio coding shall be in accordance with ABNT NBR 15602-2. However audio coding parameters for full-seg services are applied to any layers except for the partial reception layer.

4. Multiplexing

   All the technical parameters related to multiplex shall be in accordance with ABNT NBR 15602-3.

5. Service information

   While most of all the technical parameters related to service information shall be in accordance with ABNT NBR15603, there are some modifications necessary. The main points to be modified are shown here-below. See Annex 5 for the details.

   - In order to adopt BML instead of Ginga for the data broadcasting, the descriptors specifically for Ginga shall be deleted.
   - Network ID, Service ID, and Affiliation ID shall be allocated to be respectively unique within the Philippines, and Remote Control Key ID shall be allocated to be unique within each of the broadcast service areas.

6. Receiver (Note: A separate Memorandum Circular shall be issued to include the standards and specifications for Receivers)

7. Security issues

All the technical parameters related to security issues shall be in accordance with ABNT NBR 15605-1.

8. Data broadcasting

All the technical methods and parameters for BML data broadcasting, subtitle and superimposed characters coding shall be in accordance with ARIB STD-B24.

About the localization for the Philippines, the main points to be modified are character set and character coding. See Annex 8 for the details.

Data broadcasting standard is referred also in the receiver standard with respect to remote control requirements. See Annex 6 for the details.

9. Interactive channel

All the technical parameters related to interactive channel shall be in accordance with ABNT NBR 15607-1.

10. EWBS

All the technical methods and parameters shall be in accordance with ISDB-T Harmonization Document PART 3: Emergency Warning Broadcast System (EWBS).

11. Conditional Access System (CAS)

CAS is not defined as a part of the Filipino ISDB-T Standards.

However, broadcasters, in case of broadcasting a scrambled TV program with CAS, shall keep the following points;

- The scramble flag value of the TS packet header shall be set other than "00".
- The adaptation field control value of the TS packet header shall be set at either "01" or "11".
- Scrambled broadcasting shall not affect the reception of non-scrambled TV programs by those non-CAS adopted receivers.

On the other hand, broadcasters, when broadcasting non-scrambled TV programs, shall set the scramble flag value of the TS packet header at "00"; and the adaptation field control value at "01" or "11".

Furthermore, non-CAS adopted receivers shall be designed to perceive whether or not the TV program is scrambled by making reference to the scramble flag value and the adaptation field control value of the TS packet header; and in case the TV program is scrambled, it is desirable that a message indicating that the program viewing is not available appears on the screen.

Annex

Details of modifications made to the existing standards

Annex1 Transmission

The details of the modifications from ABNT NBR 15601 are shown in Table A1-1.

Table A1-1 Modification from ABNT NBR 15601

	Page	Original	Modified
7.3 Table 40; UHF Channels	8	Table 40- UHF Channels	Modified to the following table 40

Table 40 – UHF channels

Channel	Initial frequency MHz	Final frequency MHz	Central frequency MHz
*14	470	476	473+1/7
*15	476	482	479+1/7
*16	482	488	485+1/7
*17	488	494	491+1/7
*18	494	500	497+1/7
*19	500	506	503+1/7
*20	506	512	509+1/7
21	512	518	515+1/7
22	518	524	521+1/7
23	524	530	527+1/7
24	530	536	533+1/7
25	536	542	539+1/7
26	542	548	545+1/7
27	548	554	551+1/7
28	554	560	557+1/7
29	560	566	563+1/7
30	566	572	569+1/7
31	572	578	575+1/7
32	578	584	581+1/7
33	584	590	587+1/7
34	590	596	593+1/7
35	596	602	599+1/7
36	602	608	605+1/7
37	608	614	611+1/7
38	614	620	617+1/7
39	620	626	623+1/7
40	626	632	629+1/7
41	632	638	635+1/7
42	638	644	641+1/7
43	644	650	647+1/7
44	650	656	653+1/7

* Subject to Issuance of Memorandum Circular (MC) on re-allocation to the Digital Terrestrial Television Broadcasting (DTTB) Service

45	656	662	659+1/7
46	662	668	665+1/7
47	668	674	671+1/7
48	674	680	677+1/7
49	680	686	683+1/7
50	686	692	689+1/7
51	692	698	695+1/7
[52]	[698]	[704]	[701+1/7]
[53]	[704]	[710]	[707+1/7]
[54]	[710]	[716]	[713+1/7]
[55]	[716]	[722]	[719+1/7]
[56]	[722]	[728]	[725+1/7]
[57]	[728]	[734]	[731+1/7]
[58]	[734]	[740]	[737+1/7]
[59]	[740]	[746]	[743+1/7]
[60]	[746]	[752]	[749+1/7]
[61]	[752]	[758]	[755+1/7]
[62]	[758]	[764]	[761+1/7]
[63]	[764]	[770]	[767+1/7]
[64]	[770]	[776]	[773+1/7]
[65]	[776]	[782]	[779+1/7]
[66]	[782]	[788]	[785+1/7]
[67]	[788]	[794]	[791+1/7]
[68]	[794]	[800]	[797+1/7]
[69]	[800]	[806]	[803+1/7]

Annex 2 Video coding

There is no amendment to ABNT 15602-1. However video coding parameters for full-seg services are applied to any layers except for the partial reception layer.

Annex 3 Audio coding

There is no amendment to ABNT 15602-2. However audio coding parameters for full-seg services are applied to any layers except for the partial reception layer.

Annex 4 Multiplexing

There is no amendment to ABNT 15602-3

Annex 5 Service information

The details of the modifications from ABNT NBR 15603-1, 15603-2 and 15603-3 are shown in Table A5-1, A5-2 and A5-3, respectively.

Table A5-1 Modifications from ABNT NBR 15603-1

	Page	Original	Modified
6.1 PID used for tables transmission	8	··· specified by the Brazilian Ministry of Communications or signal of broadcasters.	··· specified by the National Telecommunications Commission (NTC) or signal of broadcasters.

TableA5-2 Modifications from ABNT NBR 15603-2

	Page	Original	Modified
3.2 Modified Julian Date	3	Indication of Brazilian official date	Indication of Philippines official date
8.1 Table 26: Location and requirements of SI descriptors	45	- Carousel ID descriptor - Association tag descriptor - Deferred association tag descriptor	Deleted Deleted Deleted
8.3.4 Component descriptor	48	EXAMPLE Portuguese, Brazilian official language, has 3 coded characters "por", which is coded as: "0111 0000 0110 1111 0111 0010".	EXAMPLE English has 3-character code "eng", which is coded as: "0110 0101 0110 1110 0110 0111", and Tagalog has 3-character code "tgl", which is coded as: "0111 0100 0110 0111 0110 1100"
8.3.6 Country availability descriptor	52	EXAMPLE Brazilian country has 3 character code "BRA", which is coded as: "0100 0010 0101 0010 0100 0001"	EXAMPLE Filipino country has 3 character code "PHL", which is coded as: "0101 0000 0100 1000 0100 1100"
8.3.7 Extended event descriptor	52	EXAMPLE Portuguese, Brazilian official language, has 3 coded characters "por", which is coded as: "0111 0000 0110 1111 0111 0010".	EXAMPLE English has 3-character code "eng", which is coded as: "0110 0101 0110 1110 0110 0111", and Tagalog has 3-character code "tgl", which is coded as: "0111 0100 0110 0111 0110 1100"
8.3.15 Short event descriptor	59	EXAMPLE Portuguese, Brazilian official language, has 3 coded characters "por", which is coded as: "0111 0000 0110 1111 0111 0010".	EXAMPLE English has 3-character code "eng", which is coded as: "0110 0101 0110 1110 0110 0111", and Tagalog has 3-character code "tgl", which is coded as: "0111 0100 0110 0111 0110 1100"
8.3.21 System management descriptor	61	In case of Brazilian sistem, this field always shall be 000011	In case of Filipino system, this field always shall be 000011
Annex A Data and time conversion	103	UTC-3	UTC+8

		Brazil standard time	Filipino standard time
Annex E: Area_code specification	116 117	(Whole of Annex E)	Assignment of area_code is in compliance with Appendix 10 in this document
Annex H.2: Original_network_id	122	(Whole of Annex H.2)	Refer to Annex A5-1 in this document about the structure of original_network_id.

Table A5-3 Modifications from ABNT NBR 15603-3

	Page	Original	Modified
8.2.5 Short node information descriptor	17	EXAMPLE Portuguese, Brazilian official language, has 3 coded characters "por", which is coded as; "0111 0000 0110 1111 0111 0010".	EXAMPLE English has 3-character code "eng", which is coded as: "0110 0101 0110 1110 0110 0111", and Tagalog has 3-character code "tgl", which is coded as: "0111 0100 0110 0111 0110 1100"
B.1.4.3 EIT present/following event	30	The t0 is equal to midnight in the Brazilian local time (UTC-3);	The t0 is equal to midnight in the Filipino local time (UTC+8);
B.2.7 Descriptor of the time offset table (TOT)	42	Brazilian official time and with or without daylight saving.	Filipino official time and with or without daylight saving.

A5-1 Original_network_id

Refer to Figure A5-1 about the structure of original_network_id.

Original_network_id

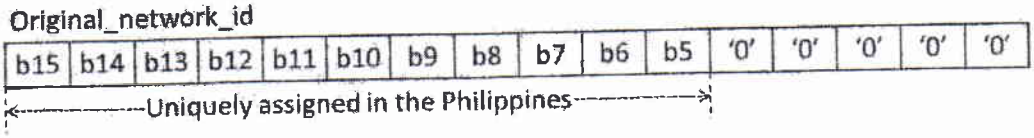

Figure A5-1 Structure of original_network_id

Annex 6 Receiver

(Note: A separate Memorandum Circular shall be issued to include the standards and specifications for Receivers)

Annex 7 Security issue

There is no amendment to ABNT NBR 15605-1.

Annex 8 Data broadcasting

All the technical methods and parameters for BML data broadcasting, subtitle and superimposed characters coding shall be in accordance with ARIB STD-B24.
ARIB STD-B24 includes the usage of UCS (Universal multi-octet coded character set) and UTF-8 (UCS Transformation Format—8-bit) in it, yet it is intended for the usage in Japan only. Therefore for the usage in the Philippines, some modifications are needed.

A8-1 Modifications for BML data broadcasting

The details of the modifications from ARIB STD-B24 necessary for BML data broadcasting in the Philippines are shown in Table A8-1-1.

Table A8-1-1 Modifications from ARIB STD-B24 (BML data broadcasting)

	Page	Original	Modified
Volume 1 Part 2 Chapter 7 7.1 JIS 8bit character code	34	Whole of section	No use in the Philippines.
Volume 1 Part 2 Chapter 7 7.2 Universal multi-octet coded Character Set (UCS)	102	- Table 7-19 Code Values for Added Symbols Set - Table 7-20 Revision to Table 7-19: Modification of code values of Additional Symbols Set to comply with JIS X0213:2004 - 7.2.1.2 Supplemental characters (Gaiji)	No use in the Philippines. For Filipino localized character set. See Table A8-1-2.
Volume 1 Part 2 Chapter 7 7.2 Universal multi-octet coded Character Set (UCS)	105	7.2.2 Coding of control code The control codes available to this standard are limited to 0x007F (DEL); 0x000D and 0x000A (CR/LF); and 0x0009 (TAB).	See "7.1.2 Coding of control function" and Tables 7-14, 7-15, 7-16, and 7-17.
Volume 1 Part 2 Chapter 7 7.2 Universal multi-octet coded Character Set (UCS)	105	7.2.3 Character encoding scheme	Adding descriptions about UTF-8. - No use "Byte Order Mark". - C0 control codes (0x00 – 0x1F) are 0x00 – 0x1F in UTF-8. - C1 control codes (0x80 – 0x9F) are 0xC280 – 0xC29F in UTF-8.
Volume 1 Part 2 Chapter 7	105	Whole of section	No use in the Philippines.

7.3 Shift-JIS Character Codes			

Table A8-1-2 Character set for the Philippines

U+0021	U+002D	U+0039	U+0045	U+0051	U+005D	U+0069	U+0075	U+00A4	U+00BC
!	-	9	E	Q	]	i	u	¤	¼
U+0022	U+002E	U+003A	U+0046	U+0052	U+005E	U+006A	U+0076	U+00A5	U+00BD
"	.	:	F	R	^	j	v	¥	½
U+0023	U+002F	U+003B	U+0047	U+0053	U+005F	U+006B	U+0077	U+00A7	U+00BE
#	/	;	G	S	_	k	w	§	¾
U+0024	U+0030	U+003C	U+0048	U+0054	U+0060	U+006C	U+0078	U+00A9	U+00D1
$	0	<	H	T	`	l	x	©	Ñ
U+0025	U+0031	U+003D	U+0049	U+0055	U+0061	U+006D	U+0079	U+00AB	U+00D7
%	1	=	I	U	a	m	y	«	×
U+0026	U+0032	U+003E	U+004A	U+0056	U+0062	U+006E	U+007A	U+00AE	U+00F1
&	2	>	J	V	b	n	z	®	ñ
U+0027	U+0033	U+003F	U+004B	U+0057	U+0063	U+006F	U+007B	U+00B0	U+00F7
'	3	?	K	W	c	o	{	°	÷
U+0028	U+0034	U+0040	U+004C	U+0058	U+0064	U+0070	U+007C	U+00B1	U+2018
(	4	@	L	X	d	p	|	±	‘
U+0029	U+0035	U+0041	U+004D	U+0059	U+0065	U+0071	U+007D	U+00B5	U+2019
)	5	A	M	Y	e	q	}	µ	’
U+002A	U+0036	U+0042	U+004E	U+005A	U+0066	U+0072	U+007E	U+00B6	U+201C
*	6	B	N	Z	f	r	~	¶	“
U+002B	U+0037	U+0043	U+004F	U+005B	U+0067	U+0073	U+00A2	U+00B7	U+201D
+	7	C	O	[	g	s	¢	·	”
U+002C	U+0038	U+0044	U+0050	U+005C	U+0068	U+0074	U+00A3	U+00BB	U+203C
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Table A8-1-2 Character set for the Philippines (Cont.)

U+2047	U+20A9	U+20B5	U+2151	U+215D	U+216A	U+217A	U+21D0	U+25BC	U+2611	U+2661	U+266E
⁇	₩	₵	⅑	⅝	XI	xi	⇐	▼	☑	♡	♮
U+2048	U+20AA	U+20B6	U+2152	U+215E	U+216B	U+217B	U+21D1	U+25BD	U+2612	U+2662	U+266F
⁉	₪	₶	⅒	⅞	XII	xii	⇑	▽	☒	♢	♯
U+2049	U+20AB	U+20B7	U+2153	U+2160	U+2170	U+2190	U+21D2	U+2600	U+2613	U+2663	U+26C4
⁉	₫	₷	⅓	I	i	←	⇒	☀	X	♣	⛄
U+20A0	U+20AC	U+20B8	U+2154	U+2161	U+2171	U+2191	U+21D3	U+2601	U+2614	U+2664	U+26C5
₠	€	₸	⅔	II	ii	↑	⇓	☁	☂	♤	⛅
U+20A1	U+20AD	U+20B9	U+2155	U+2162	U+2172	U+2192	U+21D4	U+2602	U+261C	U+2665	U+26C6
₡	₭	₹	⅕	III	iii	→	⇔	☂	☜	♥	⛆
U+20A2	U+20AE	U+20BA	U+2156	U+2163	U+2173	U+2193	U+21D5	U+2603	U+261D	U+2666	U+26C7
₢	₮	₺	⅖	IV	iv	↓	⇕	☃	☝	♦	⛇
U+20A3	U+20AF	U+2103	U+2157	U+2164	U+2174	U+2194	U+21D6	U+2604	U+261E	U+2667	U+26C8
₣	₯	℃	⅗	V	v	↔	⇖	☄	☞	♧	⛈
U+20A4	U+20B0	U+2109	U+2158	U+2165	U+2175	U+2195	U+21D7	U+2605	U+261F	U+2669	
₤	₰	℉	⅘	VI	vi	↕	⇗	★	☟	♩	
U+20A5	U+20B1	U+2116	U+2159	U+2166	U+2176	U+2196	U+21D8	U+2606	U+2639	U+266A	
₥	₱	№	⅙	VII	vii	↖	⇘	☆	☹	♪	
U+20A6	U+20B2	U+2121	U+215A	U+2167	U+2177	U+2197	U+21D9	U+260E	U+263A	U+266B	
₦	₲	℡	⅚	VIII	viii	↗	⇙	☎	☺	♫	
U+20A7	U+20B3	U+2122	U+215B	U+2168	U+2178	U+2198	U+25B2	U+260F	U+263B	U+266C	
₧	₳	™	⅛	IX	ix	↘	▲	☏	☻	♬	
U+20A8	U+20B4	U+2150	U+215C	U+2169	U+2179	U+2199	U+25B3	U+2610	U+2660	U+266D	
₨	₴	⅐	⅜	X	x	↙	△	☐	♠	♭	

A8-2 Modifications for subtitle and superimposed characters

The details of the modifications from ARIB STD-B24 necessary for subtitle and superimposed characters are shown in Table A8-2.

Table A8-2 Modifications from ARIB STD-B24 (Subtitle and superimposed characters)

	Page	Original	Modified
Volume 1 Part 3 4 Presentation function of caption and superimpose Table 4-1: Presentation function of caption	142	Kanji, hiragana, katakana, symbol, alphanumerical, Greece characters, Russian characters, ruled line, DRCS	Characters defined in UTF-8 character code
Volume 1 Part 3 5.2 Character set	144	Standard character set should be kanji, hiragana, katakana, symbol, alphanumeric, Greece characters, Russian characters, box drawing, and DRCS.	Character set defined in UCS should be used.
Volume 1 Part 3 5.5 Character coding	144	For character coding, 8bitcode shall be used.	For character coding, UTF-8 character code shall be used.
Volume 1 Part 3 5.6 Control code	144	Control code used for caption is in compliance with Volume 1, Part 2 of this standard.	Control code used for caption is in compliance with Annex A8-1 in this document.
Volume 1 Part 3 9.3.1 Table 9-8: Character coding	155	Reserved for UCS	UCS

Annex 9 Interactive channel

There is no amendment to ABNT NBR 15607-1.

Annex 10 EWBS

There is no amendment to ISDB-T Harmonization Document PART 3: Emergency Warning Broadcast System (EWBS).

Appendix

Operational Guideline

Appendix1 Transmission

Operational guideline of transmission should be referred to ABNT NBR 15608-1 with the modification as follows.

- Delete or ignore all the descriptions of VHF
- Replace DQPSK with QPSK

For more detail, please refer to the table AP1-1.

Concerning the channel planning described in the above document, coverage parameters can be defined by the Philippines based on other materials: The recommendation ITU-R BT.1368 is one of the useful materials for the planning criteria. The recommendation ITU-R BT.2036 is also useful for a reference receiving system.

Available parameters according to hierarchical transmission mode should be referred to the table AP1-2.

Table AP1-1 Modification from ABNT NBR 15608-1

	page	Original	modified
5.2 Frequency assignment	4	tables 2 and 3	table3
		tables 4,5 and 6	table 5(table6 is for CATV)
		table2 -VHF Channels	N/A
		table4-High VHF channels	N/A
	5	table 5 14ch-69ch	14-51ch, [52-69 ch]
	6	table 6	CATV
6.1 Outline	7	6.1 Outline DQPSK or 16QAM is employed	QPSK or 16QAM is employed
6.2.1 Multiplexing ...	7	6.2.1, DQPSK is preferable ...	Deleted
	8	table8	Ignore DQ and DQPSK
6.3 channel-coding...	12	DQPSK	QPSK
	13	Figure7, 8 DQPSK	QPSK
9.4.3 Data arrangement...	38	d) EXEMPLO DQPSK	QPSK
11.5 Example of link budget	57	Table42 DQPSK 1/2: 6.2 2/3: 7.7 3/4: 8.7 5/6: 9.6 7/8: 10.4	QPSK 1/2: 4.9 2/3: 6.6 3/4: 7.5 5/6: 8.5 7/8: 9.1
	58	Table43 DQPSK	QPSK

Table AP1-2 Available Parameters According to Hierarchical Transmission Mode

Patterns	Layer	Layer Name	Number of segments	Transmission (See Table AP1-3)
(1)	A	Low Protection Layer	13	a
(2)	A	Low Protection Layer	13	b
(3)	A	High Protection Layer	1 (Partial reception)	c
	B	Low Protection Layer	12	a
(4)	A	High Protection Layer	8 to 2	b
	B	Low Protection Layer	5 to 11	a
(5)	A	High Protection Layer	1 (Partial reception)	c
	B	Low Protection Layer	12	b
(6)	A	High Protection Layer	1 (Partial reception)	c
	B	Middle Protection Layer	7 to 1	b
	C	Low Protection Layer	5 to 11	a

(Note) With regard to combinations of transmission parameters, Type c of transmission mode shall take transmission parameters with an equal or lower CN ratio than Type b of transmission mode and Type b of transmission mode shall take transmission parameters with a lower CN ratio than Type a of transmission mode. The required CN ratios are shown in Table 42 of ABNT NBR 15608-1 modified according to the table AP1-1. For example, if layer A in (5) uses 16QAM and 1/2, layer B may use only 16QAM and 1/2, or 16QAM and 2/3 as shown in Type b in Table AP1-3 as modulation and error correction parameters.

Layers: A, B and C represent layers described in the TMCC signal.

Layer name: The name of the layer used in Hierarchical transmission described in ABNT NBR 15608-3.

The services provided by the layers to which transmission mode (Type a), transmission mode (Type b) and transmission mode (Type c) shown in Table AP1-2 are respectively applied may be called the "fixed service", "mobile service" and "portable service", respectively.

No digital audio service will be provided.

Table AP1-3 Transmission Parameters

Type	Mode[Note 1]			Guard Ratio[Note 1]				Time Interleave[Note 2]				Modulation and Error Correction														
												64QAM					16QAM					QPSK				
	1	2	3	1/4	1/8	1/16	1/32	I=0	I=1	I=2	I=4	7/8	5/6	3/4	2/3	1/2	7/8	5/6	3/4	2/3	1/2	7/8	5/6	3/4	2/3	1/2
a	X	X	O	O	O	O	X	X	O	O	O	O	O	O	O	O	X	X	X	O	O	X	X	X	X	X
b	X	X	O	O	O	O	X	X	O	O	O	X	X	X	X	X	X	X	X	O	O	X	X	X	O	O
c	X	X	O	O	O	O	X	X	O	O	O	X	X	X	X	X	X	X	X	X	O	X	X	X	O	O

O: Transmission parameters that can be used

X: Transmission parameters that cannot be used

Note 1: The mode and guard ratio are specified and applied to all layers and they cannot be individually specified for each layer.

Note 2: The use of "no time interleaving (I=0)" shall be restricted even in fixed reception, considering the tolerance to pulse noise.

Appendix2 Video Coding

The operational guideline of video coding should be referred to ABNT NBR 15608-2. However video coding parameters for full-seg services are applied to any layers except for the partial reception layer.

Appendix3 Audio Coding

The operational guideline of audio coding should be referred to ABNT NBR 15608-2. However audio coding parameters for full-seg services are applied to any layers except for the partial reception layer.

Appendix4 Multiplexing

The operational guideline of multiplexing should be referred to ABNT NBR 15608-3.

Appendix5 Service Information

Operational guideline of service information should be referred to ABNT NBR 15608-3 with the modification as shown in Table AP5-1.

AP5-1 Modifications from ABNT NBR 15608-3

	Page	Original	Modified
2 Normative references	1	ABNT NBR 15606-2, Digital terrestrial television	Deleted
5.1 Coding table	3	The PSI/SI table coding, including tis descriptors adheres to ISO/IEC 8859-15, as shown in Table 1.	The PSI/SI table coding, including tis descriptors adheres to UTF-8, as shown in Appendix 8. Table1, 2 and 3 should be ignored.
	4	For caption strings and data packages coding, the coding table and the control characters shown in Table 2 should be used.	For caption strings and data packages coding, the coding table and the control characters shown in Appendix 8 should be used.
	4	Furthermore, in caption string coding, it is recommended that the special G3 characters shown on Table 3 be used as specified in ABNT NBR 15606-1. Since the G3 special characters are attributed hexadecimals values	Deleted

		coincident with the character map defined by ISO/IEC 8859-15, for correct decoding, it is recommended that each G3 special characters value be preceded by the control code <SG3> (0x1D).	
Table 28 — Attribution of component_tag values	22	- 0x40 to 0x6F : Mono media and objects carousel - 0x70 to 0x7F : Events messages and data carousel (DII and DDB)	- 0x40 to 0x7F : Mono media - 0x40 to 0x7F : Events messages and data carousel (DII and DDB)
Table 30 — ES for transmission in different layers from that intended for partial reception	25	- MPEG-4 AAC Audio (48kHZ) - Mono-media Component tag value : 0x40 to 0x6F - Objects carousel - Event messages and data carousel (DII and DDB) Component tag value : 0x70 to 0x7F	- MPEG-4 AAC Audio - Mono-media Component tag value : 0x40 to 0x7F - Deleted - Event messages and data carousel (DII and DDB) Component tag value : 0x40 to 0x7F
19.2 Local_offset_time_ descriptor configuration	31-32	-UTC-3 -Brazilian	-UTC+8 -Filipino
Table 35 — Details of TOT sections	32	- UTC-3 - official Brazilian time - ="BRA"=0x425241 - See Table 36	- UTC+8 - official Filipino time - ="PHL"=0x50484C - =0
Table 36 – Sections of the local_offset_ Time_descriptor	33	Table 36	Deleted
21.2 Additional specification concerning data components Table 39	37	- data_component_id 0x0007 Ginga_XML base multimedia coding - data_component_id 0x00A4 Ginga - Application executing engine - data_component_id 0x00A3 Ginga – Application - data_component_id 0x00A0 Ginga - Application executing engine information table	· data_component_id 0x000C A profile BML (for Home TV) · data_component_id 0x000D C profile BML (for One-seg)
Table 44 - Data structure of the data content descriptor	41	"por"=0x706F72 (defines the language used in "text char")	"eng"=0x656E67 or "tgl"=0x74676C can be used

29.9.5 Daylight saving time operations (SDTT method)	77	Brazilian time (UTC-3)	Filipino time (UTC+8)
31.2 Affiliation_id	83	The affiliation_id field allows identifying which network (Globo, SBT, Record, Band, RedeTV, etc.) a broadcaster belongs.	The affiliation_id field allows identifying which network a broadcaster belongs.
31.2 Affiliation_id	83	For standardization of affiliation_id value, the characters codes shown in Table 76 should be used in order to generate the affiliation_id value for each network. The mains TV networks and your affiliation_id are shown in Table 80.	Deleted
31.2 Affiliation_id	83	Table 80	Deleted
31.2 Affiliation_id	83	The networks that are not listed in Table 80 should request the affiliation_id value to the SBTVO Forum.	Deleted

Appendix6 Receiver

(Note: A separate Memorandum Circular shall be issued to include the standards and specifications for Receivers)

Appendix7 Security Issues

The operational guideline on Security Issues should be in accordance with the Chapter 7 of the main body.

Appendix8 Data broadcasting

Operational guideline of BML data broadcasting, subtitle and superimposed characters coding should be in accordance with ARIB TR-B14 Vol.3 "DIGITAL TERRESTRIAL TELEVISION BROADCASTING Specifications for Data Broadcasting Operations".

There are some modifications for the Filipino guideline as shown in the Table AP8-1. Data broadcasting guideline is referred also in Service Information guideline in point of data_component_descriptor. See Appendix 5 for the details.

Table AP8-1 Modifications from ARIB TR-B14

	Page	Original	Modified

3 Definitions	3-2 3-3	- 8-bit character encoding - DRCS - EUC-JP - Kana-Kanji conversion	Deleted Deleted UTF-8 Deleted
1.2.1 Table 1-2 Presentation restrictions on the screen plane	3-16	- MPEG-2 - MPEG-1 - 8-bit character codes including (*)EUC-JP - 8-bit character codes	H.264 Deleted UTF-8 UTF-8.
1.2.3 Table 1-4 Overview of restriction conditions for mono-media encoding presented in each screen plane	3-21	- MPEG-2 - Stream format identification = 0x02 - MPEG-1 - 8-bit character codes(*) Including EUC-JP	- H.264|MPEG-4 AVC - Stream format identification = 0x1B - Deleted - UTF-8
1.2.4 Table 1-5 Audio playing function	3-25	- AAC-LC - Audio PES; Stream format identification = 0x0F - 48kHz,32kHz	- MPEG4-AAC standard - Audio PES; Stream format identification = 0x11 - 48kHz,44.1kHz
1.2.5 Table 1-6 Fonts	3-25	Character type	See Annex8 Table A8-1-2 for Character set for Philippines
1.4.2 Table 1-9 Type and capacity of BproNV	3-27	Whole of Table	The number of affiliations has been fixed as 24.
1.6 Character entry function	3-28	Functions not defined in this document such as the kana kanji conversion function are implementation dependent.	Deleted
1.6.1 Table 1-12 "charactertype" attribute	3-30	- hankaku - zenkaku - katakana - hiragana	- Deleted - Deleted - Deleted - Deleted
1.6.1 Function specifications	3-30	EUC-JP encoding	UTF-8 encoding
1.6.2 Table 1-14 character type	3-32	- Single byte characters - 2 byte characters	- Adding "Ñ" / "ñ" - Deleted
1.6.3 Kana Kanji conversion function	3-32	Whole of section	Deleted
3.1.1 MPEG-1 Video	3-80	Whole of section	Deleted
3.1.2 MPEG-2 Video	3-80	Whole of section	Deleted
3.1.3 MPEG-4 Visual	3-85	Encoding methods using MPEG-4 Visual are not operated.	Adding H.264|MPEG-4 AVC operation. Details in ABNT NBR 15608-2.
3.3.1 MPEG-2 AAC	3-88	Whole of section	Deleted
3.3.2 AIFF-C	3-89	Whole of section	Deleted
3.3.3 MPEG-4 Audio	3-89	Audio encoding method using MPEG-4 is not operated.	Adding MPEG4-AAC operation. Details in ABNT NBR 15608-2.

3.3.6.2 Simultaneous playable encoding method	3-90	- AAC-LC	- MPEG-4 AAC
3.4 Character encoding	3-91	Whole of section	No use in the Philippines
Volume 3 Section 2 4.2,8.7 Data Contents Descriptor Table 4-10 Setup parameters of the Data Content Descriptor for caption	3-107	Fixed to jpn(Japanese).	"eng"=0x656E67 or "tgl"=0x74676C can be used
Volume 3 Section 2 4.4.1 Character codes	3-109	The character encoding method used for caption/superimpose is 8-bit character codes.	The character encoding method used for caption/superimpose is UTF-8 character code.
Volume 3 Section 2 4.4.3 Character size control	3-109	Restrictions related to character display are stipulated in Table 4-14	Deleted
Volume 3 Section 2 4.4.3 Character size control Table 4-14 Area of coding group that can be used for specification of display format and specification of character size controls	3-110	Whole table	Deleted
Volume 3 Section 2 4.4.3 Character size control	3-111	Whole of paragraph (1)	
Volume 3 Section 2 4.4.3 Character size control	3-111	(2)	Deleted
Volume 3 Section 2 4.5.1 Control codes	3-123	Control codes used in caption are in compliance with ARIB STD-B24 Vol. 1 Part 2, 7.1.2.	Control codes used in caption are in compliance with Annex A8-1 in this document
Volume 3 Section 2 4.5.2 Operation of flashing	3-132	Flashing of the 8-bit character codes character string does the character flashing	Flashing string ("FLC") of the UTF-8 enables the character flashing
Volume 3 Section 2 4.6 Operation of the	3-135 3-136	Whole section	Deleted

DRCS			
5.2 Operation of NVRAM	3-142	able 5-1 NVRAM used in Digital Terrestrial Television Broadcasting	The maximum number of Affiliations and Networks in one broadcasting area should be set as 24, considering that the existing number of analog broadcasting stations in Metro Manila is around 20. See Table AP8-2 as the exact list of NVRAM when using the number of 24.
5.5 Operation of character codes	3-159	Refer to ARIB STD-B24 Vol. 2 Appendix 2 "4.1. Character codes".	UTF-8
5.5.1 Transmission of DRCS pattern data	3-159	Whole of section	Deleted
5.6 Operation area of media type and mono-media	3-160	charset='euc-jp'	charset='UTF-8'
5.7.3 Table 5-9 Operational guidelines relating to the attributes of elements	3-164	- Fixed to "ja" - Fixed to "EUC-JP" - ・・・and type attribute is either "audio/X-arib-aiff" or "audio/X-arib-mpeg2-aac".	- Fixed to "tl" - Fixed to "UTF-8" - ・・・and type attribute is "audio/X-arib-mpeg4-aac".
5.11 Presentation control of BML document	3-175	- "video/X-arib-mpeg1" or "video/X-arib-mpeg2" - "audio/X-arib-mpeg2-aac"	- "video/X-arib-H264-high" - "audio/X-arib-mpeg4-aac"
5.14.6.6 Interaction channel function-TCP/IP	3-201 3-202	EUC-JP	UTF-8
5.14.6.12 External character function	3-209	Whole of section	Deleted
5.14.8 Operation guideline for transmission of communication contents	3-215 ~3-220	- ja - audio/X-arib-mpeg2-aac - audio/X-arib-aiff - application/X-arib-drcs - EUC-JP	- tl - audio/X-arib-mpeg4-aac - Deleted - Deleted - UTF-8
Appendix 5-1 DTD	3-280	EUC-JP	UTF-8
1 Introduction	3-301	MPEG-2 AAC	MPEG-4 AAC
3.2.4 Table 3-6 Desired audio mono-media to be presented	3-310	- MPEG-2 AAC - stream format identifier = 0x0F - Sampling frequency 24kHz, 48kHz	- MPEG-4 AAC - stream format identifier = 0x11 - Sampling frequency 32kHz, 44.1kHz, 48kHz
3.2.5 Table 3-7 Fonts	3-310	- Kanji (level 1, 2) - Hirakana - Katakana	- Deleted - Deleted - Deleted
3.4.2 Table 3-10 Type and capacity of BproNV	3-313	- 288KB(12 affiliations x 24KB)	The number of affiliations has been fixed as 24.

3.6.3 Character types	3-314	- refer to ARIB STD-B24, Vol. 1, Part 2, 7.3 - Kanji	- refer to ARIB STD-B24, Vol. 1, Part 2, 7.2 (Refer Annex8 A8-1) - Deleted
3.6.4 Kana Kanji conversion function	3-314	Whole of section	Deleted
4.1.2.4 Configuration of the ES transmitted by 1 service	3-330	MPEG-2 AAC	MPEG-4 AAC
4.1.5.1 Receiver operation at the beginning of data broadcasting	3-333	Moreover, Playback is executed as an audio stream of MPEG-2 AAC (sampling frequency = 24KHz) if the component of the component_tag=0x83 or 0x84 is included. Similarly, Playback is executed out as an audio stream of MPEG-2 AAC (sampling frequency = 48KHz) if the component of the component_tag=0x85 or 0x86 is included.	Moreover, Playback is executed as an audio stream of MPEG-4 AAC (sampling frequency = 48KHz) if the component of the component_tag=0x83 or 0x84 is included. Similarly, Playback is executed out as an audio stream of MPEG-4 AAC (sampling frequency = 44.1KHz) if the component of the component_tag=0x85 or 0x86 is included. Similarly, Playback is executed out as an audio stream of MPEG-4 AAC (sampling frequency = 32KHz) if the component of the component_tag=0x90 or 0x91 is included.
5.1.1 H.264|MPEG-4 AVC	3-355	Whole of section	Details in ABNT NBR 15608-2.
5.3.1 MPEG-2 AAC	3-369	Whole of section	MPEG-4 AAC Follows ABNT NBR 15608-2
5.3.5 Audiosynthesis of receiver units	3-371	MPEG-2 AAC	-MPEG-4 AAC
5.4 Character codes	3-372	- 5.4.1 8-bit character codes for C-profile - 5.4.2 Shift JIS	- Deleted - 5.4.1 UTF-8
Volume 3 Section 4 6.2.4 Operation of closed caption management data Table 6-3: Closed caption management data parameters	3-376	Used language code ("jpn" fixed)	Used language code ("eng"=0x656E67 or "tgl"=0x74676C can be used)
Volume 3 Section 4 6.4.1 Character entity	3-379	Whole sentences and Table 6-2	Deleted
Volume 3 Section 4	3-379		The character encoding method used for closed caption is UTF-8

6.4.1 Character entity			character code. Control code range is from 0x00 to 0x1F (inclusive) and from 0xC280 to 0xC29F (inclusive).
Volume 3 Section 4 6.5 Control code used in closed caption	3-381	The control code used in the closed caption is compliant with ARIB STD-B24, Vol. 1, Part 2, 7.1.2.	The control code used in the closed caption is compliant with Annex A8-1 in this document.
7.2 Operation of NVRAM in Digital Terrestrial Television C-profile broadcasting	3-388	Table 7-1 NVRAM used by Digital Terrestrial Television C-profile broadcasting	The maximum number of Affiliations and Networks in one broadcasting area should be set as 24, considering that the existing number of analog broadcasting stations in Metro Manila is around 20. See Table AP8-3 as the exact list of NVRAM when using the number of 24.
7.5 Operation of character coding schemes	3-393	See ARIB STD-B24, Vol. 2, Appendix 4, "4.1. Character Coding Schemes".	Using UTF-8
7.7.1 Declaration of XML and DOCTYPE	3-393	Shift_JIS	UTF-8
7.73 Table 7-5 Operations for attributes of elements	3-397	- Shift_JIS - audio/X-arib-mpeg2-aac	- UTF-8 - audio/X-arib-mpeg4-aac
7.9 extended property specification	3-414	- Refer to the ARIB STD-B24, Vol. 1, Part 2, Chapter 7, 7.3 "Shift-JIS character codes" - Kanji set	- Refer to ARIB STD-B24, Vol. 1, Part 2, 7.2 (Refer Annex8 A8-1) - Deleted
7.10.7 Extended function provided by digital terrestrial broadcasting (2)	3-447	- tokyo_dgree - tokyo_dms	- Deleted - Deleted
7.12.6.1 Table 7-27 Attribute operation related to stream presentation	3-465	audio/X-arib-mpeg2-aac	audio/X-arib-mpeg4-aac

Table AP8-2 NVRAM usage for the Philippines A-profile Data broadcasting

Type	Meaning	NVRAM amount
A-profile memory area for all the broadcasters	Common area available for use by all terrestrial digital broadcasters.	2KB (Fixed length block of 64bytes * 32)
A-profile memory area for the affiliation	Common area available for use by broadcasters that belong to the same system.	·4KB for one Affiliation (Fixed length block of 64bytes * 64) ·Number of systems: more than 24
A-profile memory area	Area occupied by each	·4KB for one broadcaster

for the specified broadcaster	broadcaster	(Fixed length block of 64bytes * 64) ·Number of broadcasters that should be secured by receiver units simultaneously: more than 24
A-profile memory area of communication purpose for the specified broadcaster	Area to share information with broadcasting contents and communication contents	·2KB for 1 broadcaster. (Fixed length block of 64bytes *32) ·Number of broadcasters that should be secured by receiver simultaneously: more than 24
Memory area for bookmark service	Area available to use for the bookmark service	·Total of more than 50 blocks of variable length block with maximum of 320 bytes.
Memory area for root CA certificates	Area to store root CA certificate of general purpose transmitted by carousels in memory.	·3KB for one certificate ·Quantity : 8
Memory area for registration transmission	Area to store messages that carry out registration transmission	·More than 3 blocks of variable length block with maximum of 1.5 KB.

Table AP8-3 NVRAM usage for the Philippines C-profile Data broadcasting

Class	Purpose	Capacity of NVRAM
Digital Terrestrial Television C-profile area for the affiliation	Area used commonly by operators belonging to the same affiliation area	• 24KB per affiliation (64 byte fixed block * 384) • 8KB out of 24KB is for inner affiliation common area, and the remaining 16KB is divided by 8 and used as the individual operator area. • Affiliation number: 24 affiliations
TVlink area	Area used for TVlink service	• Maximum of 256 bytes variable block • Writable block number: 50 or more

Appendix9 Interactive channel

The operational guideline on the Interactive channel should be in accordance with the Chapter 9 of the main body.

Appendix10 EWBS

The operational guideline on EWBS should be in accordance with the Chapter 10 of the main body. Area codes in the Philippines are as follows.

AP10-1 Area code

For the EWBS application purpose, receivers should pre-store the area code allocation table. In accordance with ABNT15603, area code uses a 12-bit string, with the left bit first, as shown in Fig AP10-1

Fig AP10-1 12-bit string for area code

b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0

AP10-2 Concept of area code allocation in the Philippines

The concept of area code allocation in the Philippines is based on 3 layers of the hierarchical structure as shown in Fig AP10-2.

"Wide area zone" has Nationwide and 3 zones such as Luzon, Visayas and Mindanao.

"Region" has 17 regions and "City" has 118 cities.

Fig AP10-2 Hierarchical structure of Area code

Wide area zone	Region	City
b11 b10 b9	b8 b7 b6 b5	b4 b3 b2 b1 b0

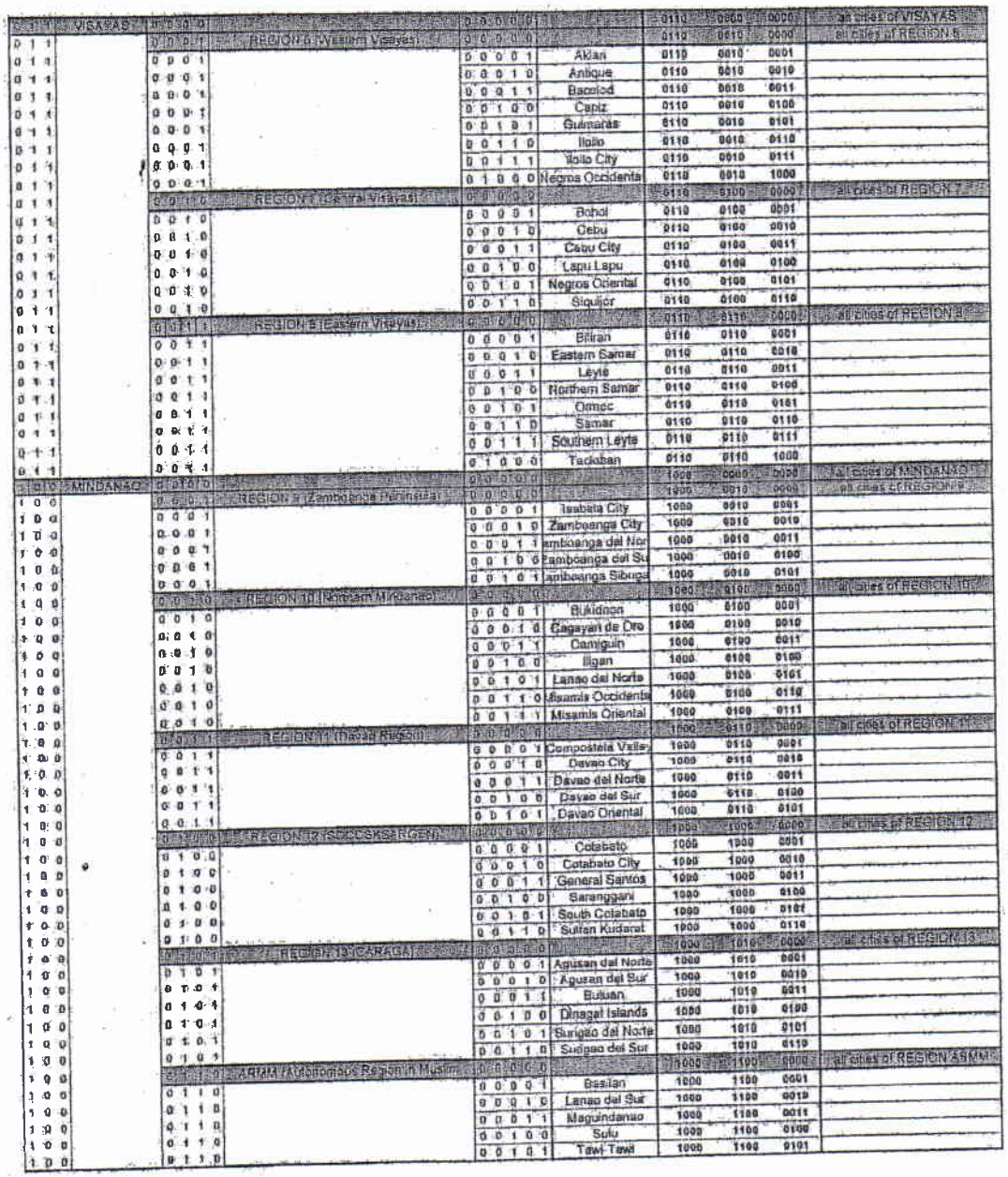
AP10-3 Actual allocation table

The actual allocation table of area code in the Philippines is shown in Fig AP10-3;

Fig AP10-3 Area code allocation Table 1/2

WIDE AREA ZONE	REGION	CITY		AREA CODE	Description
b9 b8 b7 b6	b6 b7 b8 b9	b4 b3 b2 b1 b0		b15 b14 b13 b12 b11 b10 b9 b8 | b7 b6 b5 b4 | b3 b2 b1 b0	
0 0 0 NATIONWIDE	0 0 0 0	0 0 0 0 0		0010 0000 0000	all cities of the Philippines
0 1 0 LUZON	0 0 0 0	0 0 0 0 0		0100 0000 0000	all cities of LUZON
0 1 0	0 0 0 1 NCR	0 0 0 0 0		0100 0010 0000	all cities of NCR
0 1 0	0 0 0 1	0 0 0 0 1	Caloocan	0100 0010 0001	
0 1 0	0 0 0 1	0 0 0 1 0	Las Piñas	0100 0010 0010	
0 1 0	0 0 0 1	0 0 0 1 1	Makati	0100 0010 0011	
0 1 0	0 0 0 1	0 0 1 0 0	Malabon	0100 0010 0100	
0 1 0	0 0 0 1	0 0 1 0 1	Mandaluyong	0100 0010 0101	
0 1 0	0 0 0 1	0 0 1 1 0	Manila	0100 0010 0110	
0 1 0	0 0 0 1	0 0 1 1 1	Marikina	0100 0010 0111	
0 1 0	0 0 0 1	0 1 0 0 0	Muntinlupa	0100 0010 1000	
0 1 0	0 0 0 1	0 1 0 0 1	Navotas	0100 0010 1001	
0 1 0	0 0 0 1	0 1 0 1 0	Parañaque	0100 0010 1010	
0 1 0	0 0 0 1	0 1 0 1 1	Pasay	0100 0010 1011	
0 1 0	0 0 0 1	0 1 1 0 0	Pasig	0100 0010 1100	
0 1 0	0 0 0 1	0 1 1 0 1	Pateros	0100 0010 1101	
0 1 0	0 0 0 1	0 1 1 1 0	Quezon City	0100 0010 1110	
0 1 0	0 0 0 1	0 1 1 1 1	San Juan	0100 0010 1111	
0 1 0	0 0 0 1	1 0 0 0 0	Taguig	0100 0011 0000	
0 1 0	0 0 0 1	1 0 0 0 1	Valenzuela	0100 0011 0001	
0 1 0	0 0 1 0 CAR (Cordillera Administrative Region)	0 0 0 0 0		0100 0100 0000	all cities of CAR
0 1 0	0 0 1 0	0 0 0 0 1	Abra	0100 0100 0001	
0 1 0	0 0 1 0	0 0 0 1 0	Apayao	0100 0100 0010	
0 1 0	0 0 1 0	0 0 0 1 1	Baguio	0100 0100 0011	
0 1 0	0 0 1 0	0 0 1 0 0	Benguet	0100 0100 0100	
0 1 0	0 0 1 0	0 0 1 0 1	Ifugao	0100 0100 0101	
0 1 0	0 0 1 0	0 0 1 1 0	Kalinga	0100 0100 0110	
0 1 0	0 0 1 0	0 0 1 1 1	Mt. Province	0100 0100 0111	
0 1 0	0 0 1 1 REGION 1 (Ilocos Region)	0 0 0 0 0		0100 0110 0000	all cities of REGION 1
0 1 0	0 0 1 1	0 0 0 0 1	Ilocos Norte	0100 0110 0001	
0 1 0	0 0 1 1	0 0 0 1 0	Ilocos Sur	0100 0110 0010	
0 1 0	0 0 1 1	0 0 0 1 1	La Union	0100 0110 0011	
0 1 0	0 0 1 1	0 0 1 0 0	Pangasinan	0100 0110 0100	
0 1 0	0 1 0 0 REGION 2 (Cagayan Valley)	0 0 0 0 0		0100 1000 0000	all cities of REGION 2
0 1 0	0 1 0 0	0 0 0 0 1	Batanes	0100 1000 0001	
0 1 0	0 1 0 0	0 0 0 1 0	Cagayan	0100 1000 0010	
0 1 0	0 1 0 0	0 0 0 1 1	Isabela	0100 1000 0011	
0 1 0	0 1 0 0	0 0 1 0 0	Nueva Vizcaya	0100 1000 0100	
0 1 0	0 1 0 0	0 0 1 0 1	Quirino	0100 1000 0101	
0 1 0	0 1 0 0	0 0 1 1 0	Santiago	0100 1000 0110	
0 1 0	0 1 0 1 REGION 3 (Central Luzon)	0 0 0 0 0		0100 1010 0000	all cities of REGION 3
0 1 0	0 1 0 1	0 0 0 0 1	Angeles	0100 1010 0001	
0 1 0	0 1 0 1	0 0 0 1 0	Aurora	0100 1010 0010	
0 1 0	0 1 0 1	0 0 0 1 1	Bataan	0100 1010 0011	
0 1 0	0 1 0 1	0 0 1 0 0	Bulacan	0100 1010 0100	
0 1 0	0 1 0 1	0 0 1 0 1	Nueva Ecija	0100 1010 0101	
0 1 0	0 1 0 1	0 0 1 1 0	Olongapo	0100 1010 0110	
0 1 0	0 1 0 1	0 0 1 1 1	Pampanga	0100 1010 0111	
0 1 0	0 1 0 1	0 1 0 0 0	Tarlac	0100 1010 1000	
0 1 0	0 1 0 1	0 1 0 0 1	Zambales	0100 1010 1001	
0 1 0	0 1 1 0 REGION 4-A (CALABARZON)	0 0 0 0 0		0100 1100 0000	all cities of REGION 4-A
0 1 0	0 1 1 0	0 0 0 0 1	Batangas	0100 1100 0001	
0 1 0	0 1 1 0	0 0 0 1 0	Cavite	0100 1100 0010	
0 1 0	0 1 1 0	0 0 0 1 1	Laguna	0100 1100 0011	
0 1 0	0 1 1 0	0 0 1 0 0	Lucena	0100 1100 0100	
0 1 0	0 1 1 0	0 0 1 0 1	Quezon	0100 1100 0101	
0 1 0	0 1 1 0	0 0 1 1 0	Rizal	0100 1100 0110	
0 1 0	0 1 1 1 REGION 4-B (MIMAROPA)	0 0 0 0 0		0100 1110 0000	all cities of REGION 4-B
0 1 0	0 1 1 1	0 0 0 0 1	Marinduque	0100 1110 0001	
0 1 0	0 1 1 1	0 0 0 1 0	Occidental Mindoro	0100 1110 0010	
0 1 0	0 1 1 1	0 0 0 1 1	Oriental Mindoro	0100 1110 0011	
0 1 0	0 1 1 1	0 0 1 0 0	Palawan	0100 1110 0100	
0 1 0	0 1 1 1	0 0 1 0 1	Puerto Princesa	0100 1110 0101	
0 1 0	0 1 1 1	0 0 1 1 0	Romblon	0100 1110 0110	
0 1 0	1 0 0 0 REGION 5 (Bicol Region)	0 0 0 0 0		0101 0000 0000	all cities of REGION 5
0 1 0	1 0 0 0	0 0 0 0 1	Albay	0101 0000 0001	
0 1 0	1 0 0 0	0 0 0 1 0	Camarines Sur	0101 0000 0010	
0 1 0	1 0 0 0	0 0 0 1 1	Camarines Norte	0101 0000 0011	
0 1 0	1 0 0 0	0 0 1 0 0	Catanduanes	0101 0000 0100	
0 1 0	1 0 0 0	0 0 1 0 1	Masbate	0101 0000 0101	
0 1 0	1 0 0 0	0 0 1 1 0	Naga	0101 0000 0110	
0 1 0	1 0 0 0	0 0 1 1 1	Sorsogon	0101 0000 0111	

Fig AP10-3 Area code allocation Table - 2/2



0 1 1	VISAYAS	0 0 0 0		0 0 0 0 0 1		0110	0000	0000	all cities of VISAYAS
0 1 1		0 0 0 1	REGION 6 (Western Visayas)	0 0 0 0 0		0110	0010	0000	all cities of REGION 6
0 1 1		0 0 0 1		0 0 0 0 0 1	Aklan	0110	0010	0001	
0 1 1		0 0 0 1		0 0 0 0 1 0	Antique	0110	0010	0010	
0 1 1		0 0 0 1		0 0 0 0 1 1	Bacolod	0110	0010	0011	
0 1 1		0 0 0 1		0 0 0 1 0 0	Capiz	0110	0010	0100	
0 1 1		0 0 0 1		0 0 0 1 0 1	Guimaras	0110	0010	0101	
0 1 1		0 0 0 1		0 0 0 1 1 0	Iloilo	0110	0010	0110	
0 1 1		0 0 0 1		0 0 0 1 1 1	Iloilo City	0110	0010	0111	
0 1 1		0 0 0 1		0 0 1 0 0 0	Negros Occidental	0110	0010	1000	
0 1 1		0 0 1 0	REGION 7 (Central Visayas)	0 0 0 0 0		0110	0100	0000	all cities of REGION 7
0 1 1		0 0 1 0		0 0 0 0 0 1	Bohol	0110	0100	0001	
0 1 1		0 0 1 0		0 0 0 0 1 0	Cebu	0110	0100	0010	
0 1 1		0 0 1 0		0 0 0 0 1 1	Cebu City	0110	0100	0011	
0 1 1		0 0 1 0		0 0 0 1 0 0	Lapu Lapu	0110	0100	0100	
0 1 1		0 0 1 0		0 0 0 1 0 1	Negros Oriental	0110	0100	0101	
0 1 1		0 0 1 0		0 0 0 1 1 0	Siquijor	0110	0100	0110	
0 1 1		0 0 1 1	REGION 8 (Eastern Visayas)	0 0 0 0 0		0110	0110	0000	all cities of REGION 8
0 1 1		0 0 1 1		0 0 0 0 0 1	Biliran	0110	0110	0001	
0 1 1		0 0 1 1		0 0 0 0 1 0	Eastern Samar	0110	0110	0010	
0 1 1		0 0 1 1		0 0 0 0 1 1	Leyte	0110	0110	0011	
0 1 1		0 0 1 1		0 0 0 1 0 0	Northern Samar	0110	0110	0100	
0 1 1		0 0 1 1		0 0 0 1 0 1	Ormoc	0110	0110	0101	
0 1 1		0 0 1 1		0 0 0 1 1 0	Samar	0110	0110	0110	
0 1 1		0 0 1 1		0 0 0 1 1 1	Southern Leyte	0110	0110	0111	
0 1 1		0 0 1 1		0 0 1 0 0 0	Tacloban	0110	0110	1000	
0 1 1	MINDANAO	0 1 0 0		0 0 0 0 0 0		1000	0000	0000	all cities of MINDANAO
1 0 0		0 1 0 0	REGION 9 (Zamboanga Peninsula)	0 0 0 0 0 0		1000	0010	0000	all cities of REGION 9
1 0 0		0 1 0 0		0 0 0 0 0 1	Isabela City	1000	0010	0001	
1 0 0		0 1 0 0		0 0 0 0 1 0	Zamboanga City	1000	0010	0010	
1 0 0		0 1 0 0		0 0 0 0 1 1	Zamboanga del Nor	1000	0010	0011	
1 0 0		0 1 0 0		0 0 0 1 0 0	Zamboanga del Su	1000	0010	0100	
1 0 0		0 1 0 0		0 0 0 1 0 1	Zamboanga Sibuga	1000	0010	0101	
1 0 0		0 1 0 0	REGION 10 (Northern Mindanao)	0 0 0 0 0		1000	0100	0000	all cities of REGION 10
1 0 0		0 1 0 0		0 0 0 0 0 1	Bukidnon	1000	0100	0001	
1 0 0		0 1 0 0		0 0 0 0 1 0	Cagayan de Oro	1000	0100	0010	
1 0 0		0 1 0 0		0 0 0 0 1 1	Camiguin	1000	0100	0011	
1 0 0		0 1 0 0		0 0 0 1 0 0	Iligan	1000	0100	0100	
1 0 0		0 1 0 0		0 0 0 1 0 1	Lanao del Norte	1000	0100	0101	
1 0 0		0 1 0 0		0 0 0 1 1 0	Misamis Occidental	1000	0100	0110	
1 0 0		0 1 0 0		0 0 0 1 1 1	Misamis Oriental	1000	0100	0111	
1 0 0		0 1 0 1	REGION 11 (Davao Region)	0 0 0 0 0		1000	0110	0000	all cities of REGION 11
1 0 0		0 1 0 1		0 0 0 0 1	Compostela Valley	1000	0110	0001	
1 0 0		0 1 0 1		0 0 0 1 0	Davao City	1000	0110	0010	
1 0 0		0 1 0 1		0 0 0 1 1	Davao del Norte	1000	0110	0011	
1 0 0		0 1 0 1		0 0 1 0 0	Davao del Sur	1000	0110	0100	
1 0 0		0 1 0 1		0 0 1 0 1	Davao Oriental	1000	0110	0101	
1 0 0		0 1 1 0	REGION 12 (SOCCSKSARGEN)	0 0 0 0 0		1000	1000	0000	all cities of REGION 12
1 0 0		0 1 1 0		0 0 0 0 1	Cotabato	1000	1000	0001	
1 0 0		0 1 1 0		0 0 0 1 0	Cotabato City	1000	1000	0010	
1 0 0		0 1 1 0		0 0 0 1 1	General Santos	1000	1000	0011	
1 0 0		0 1 1 0		0 0 1 0 0	Sarangani	1000	1000	0100	
1 0 0		0 1 1 0		0 0 1 0 1	South Cotabato	1000	1000	0101	
1 0 0		0 1 1 0		0 0 1 1 0	Sultan Kudarat	1000	1000	0110	
1 0 0		0 1 1 1	REGION 13 (CARAGA)	0 0 0 0 0		1000	1010	0000	all cities of REGION 13
1 0 0		0 1 1 1		0 0 0 0 1	Agusan del Norte	1000	1010	0001	
1 0 0		0 1 1 1		0 0 0 1 0	Agusan del Sur	1000	1010	0010	
1 0 0		0 1 1 1		0 0 0 1 1	Butuan	1000	1010	0011	
1 0 0		0 1 1 1		0 0 1 0 0	Dinagat Islands	1000	1010	0100	
1 0 0		0 1 1 1		0 0 1 0 1	Surigao del Norte	1000	1010	0101	
1 0 0		0 1 1 1		0 0 1 1 0	Surigao del Sur	1000	1010	0110	
1 0 0		1 0 0 0	ARMM (Autonomous Region in Musli	0 0 0 0 0		1000	1100	0000	all cities of REGION ARMM
1 0 0		1 0 0 0		0 0 0 0 1	Basilan	1000	1100	0001	
1 0 0		1 0 0 0		0 0 0 1 0	Lanao del Sur	1000	1100	0010	
1 0 0		1 0 0 0		0 0 0 1 1	Maguindanao	1000	1100	0011	
1 0 0		1 0 0 0		0 0 1 0 0	Sulu	1000	1100	0100	
1 0 0		1 0 0 0		0 0 1 0 1	Tawi-Tawi	1000	1100	0101	

Appendix11 Conditional Access System (CAS)

The operational guideline on-CAS should be in accordance with the Chapter 11 of the main body.

Appendix 12 Outline of operational parameters

Some operation parameters for Filipino digital terrestrial television broadcasting are shown in Table AP12-1

Table AP12-1

Item		Contents	Standard	Reference
DTTB System		ISDB-T	ABNT NBR 15601	http://www.dibeg.org/tech/aribstd/harmonization/090918_Harmonization_volume1_transmission.pdf
Operating Channel		512 Mhz to 698 Mhz		
Channel Bandwidth	Full Segment	5.571 Mhz		
	One Segment	0.428 Mhz		
Center Frequency		(515 + 1/7) Mhz to (695 + 1/7) Mhz		
Transmission Mode		Mode 3		
Guard Interval Ratio		1/4, 1/8, 1/16		
Carrier Modulation	Full Segment	QPSK, 16 QAM, 64 QAM		
	One Segment	QPSK, 16 QAM		
Error Correction (Inner Code)		Convolutional Code (Coding Rate: 1/2, 2/3, 3/4, 5/6 or 7/8)		
Error Correction (Outer Code)		(204, 188) Reed-Solomon Code		
Interleave	Full Segment	Frequency and Timex Interleave		
	One Segment	Time Interleave: 0 to 1.5		
Video Coding		H. 264 | MPEG-4 AVC(ISO/IEC 14496-10	ABNT NBR 15602-1	http://www.dibeg.org/tech/aribstd/harmonization/090918_Harmonization_volume2_Video.pdf
Video Profile	Full Segment	up to HP@ L4.0		
	One Segment	up to BP @ L1.3		
Video Format	Full Segment	480i, 480p, 720p, 1080i		
	One Segment	SQVGA, QVGA, CIF		
Video Frame Rate	Full Segment	30 fps, 60 fps		
	One Segment	5, 10, 12, 15, 24, 30 fps		
Audio Coding		MPEG-4 ACC (ISO/IEC 14496-3)	ABNT NBR 15602-2	http://www.dibeg.org/tech/aribstd/harmonization/090918_Harmonization_volume3_Audio.pdf
Audio Profile	Full Segment	LC AAC @ L2, L4		
	One Segment	HE-AAC + SBR v.1 @ L2, L4		
		HE-AAC + SBR + PS v.2 @ L2		
Audio Sampling Frequency	Full Segment	48kHz, 44.1 kHz		
	One Segment	48kHz, 44.1kHz, 32kHz		
		AAC sampling frequency: 24kHz, 22.05kHz, 16 kHz		
Multiplexing		MPEG-2 Systems (ISO/IEC 13818-1)	ABNT NBR 15602-3	http://www.dibeg.org/tech/aribstd/harmonization/090918_Harmonization_volume1_Multiplexing.pdf
EWBS		Part 3: Emergency Warning Broadcast System EWBS		http://www.dtpr.org/news/2013/1310_An_Article_about_the_Standardization_of_EWBS/1310_An_Article_about_the_Standardization_of_EWBS.html

Bibliography

(ITU Recommendation)

http://www.itu.int/en/publications/Pages/default.aspx

(ISO/IEC standards)

http://www.iso.org/iso/home/store/catalogue_tc/catalogue_tc_browse.htm?commid=45316

(ARIB Standards)

http://www.arib.or.jp/english/html/overview/sb_ej.html

The versions of ARIB Standards refered in the Filipino ISDB-T Standards are as follows.

Standrd		Version
Number	Title	
ARIB STD-B24	Data Coding and Transmission Specification for Digital Broadcasting	5.2
ARIB TR-B14	OPERATIONAL GUIDELINES FOR DIGITAL TERRESTRIAL TELEVISION BROADCASTING	3.8

(ABNT Standards)

http://forumsbtvd.org.br/acervo-online/normas-brasileiras-de-tv-digital/

The versions of ABNT Standards refered in the Filipino ISDB-T Standards are as follows.

Standrd		Version
Number	Title	
ABNT NBR 15601	Digital terrestrial television – Transmission system	2007
ABNT NBR 15602-1	Digital terrestrial television – Video coding, audio coding and multiplexing Part 1: Video coding	2007
ABNT NBR 15602-2	Digital terrestrial television – Video coding, audio coding and multiplexing Part 2: Audio coding	2007
ABNT NBR 15602-3	Digital terrestrial television – Video coding, audio coding and multiplexing Part 3: Signal multiplexing systems	2007
ABNT NBR 15603-1	Digital terrestrial television – Multiplexing and service information (SI) Part 1: SI for digital broadcasting systems	2008
ABNT NBR 15603-2	Digital terrestrial television – Multiplexing and service information (SI) Part 2: Data structure and definitions of basic information of SI Descriptors:	2009
ABNT NBR 15603-3	Digital terrestrial television – Multiplexing and service information (SI) Part 3: Syntaxes and definitions of extension	2009

	information of SI Descriptors:	
ABNT NBR 15605-1	Digital terrestrial television — Security issues Part 1: Copy control	2009
ABNT NBR 15607-1	Digital terrestrial television — Interactive channel Part 1: Protocols, physical interfaces and software interfaces	2011
ABNT NBR 15608-1	Digital terrestrial television – Operational guideline Part 1: Transmission system – Guide for implementation of ABNT NBR 15601:2007	2008
ABNT NBR 15608-2	Digital terrestrial television – Operational guideline Part 2: Video coding, audio coding and multiplexing – Guideline for implementation of ABNT NBR 15602:2007	2010
ABNT NBR 15608-3	Digital terrestrial television — Operational guideline Part 3: Multiplexing and service information (SI) – Guideline for implementation of ABNT NBR 15603:2007	2012

(ISDB-T Harmonization Document)

http://www.dibeg.org/techp/aribstd/harmonization.html