



ATSC

ADVANCED TELEVISION
SYSTEMS COMMITTEE

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Revision History

Version	Date
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1. OVERVIEW

1.1 Definition

A Corrigendum is generated to correct an error or ambiguity in an ATSC document introduced either in drafting or publication of the document that could lead to incorrect or unsafe application of the document. Correction of a technical defect shall in no way cause a change in functionality. Corrigenda shall be published as attachments to the original ATSC document. Distribution by ATSC of existing documents shall include any approved Corrigenda.

1.2 Scope

This document describes the necessary update to the A/326:2023-03.

1.3 Rationale for Changes

In example configuration settings of Annex B (Table B.1.1), the following values should be corrected:

- Annex B, Table B.1, Configuration 1:
 - PLP Modulation: 64 → 16
 - PLP Size: 1467351 → 1440472
 - # Payload Symbols: 54 → 53
 - Data rate: 15.8204 → 15.815
- Annex B, Table B.1, Configuration 2
 - PLP 0 Size: 259200 → 226800
 - PLP HTI # Max FEC Blocks PLP 0: 8 → 7
 - PLP HTI # Max FEC Blocks PLP 1: 120 → 111
 - PLP HTI # FEC Blocks PLP 0: 8 → 7
 - Number of payload symbols: 54 → 53
- Annex B, Table B.1, Configuration 5
 - PLP Size: 1467351 → 1440472
 - MISO → SISO
 - Number of payload symbols: 54 → 53
- Footnote 5 (p.45)
 - PLP Size: 1440445 → 1440472

2. LIST OF CHANGES

Inserted text, tables, and drawings are shown in **blue**; deletions of existing text are shown in **red** ~~strikeout~~.

Annex B: Configuration Settings Examples

B.1 DEVICE UNDER TEST CONFIGURATIONS

Table B.1.1 Example DUT Configurations Representing a Variety of Possible Test Transmission Modes for Consideration

	Parameter	Configuration 1	Configuration 2	Configuration 3	Configuration 4	Configuration 5	Configuration 6
Testing Reference	Verification and Validation test stream	VV600-P6S1	VV601-P6S1	VV602-P6S1	VV603-P6S1	VV604-P6S1	VV605-P6S1
Bootstrap	Channel Bandwidth	6 MHz	6 MHz	6 MHz	6 MHz	6 MHz	6 MHz
	Sample Rate	6.912 MHz	6.912 MHz	6.912 MHz	6.912 MHz	6.912 MHz	6.912 MHz
Input Formatting	ALP Packet Length	1200 byte $2^{23}-1$ PRBS +8byte UDP Header +20byte IPv4 Header +2byte ALP Header	1200 byte $2^{23}-1$ PRBS +8byte UDP Header +20byte IPv4 Header +2byte ALP Header	1200 byte $2^{23}-1$ PRBS +8byte UDP Header +20byte IPv4 Header +2byte ALP Header	1200 byte $2^{23}-1$ PRBS +8byte UDP Header +20byte IPv4 Header +2byte ALP Header	1200 byte $2^{23}-1$ PRBS +8byte UDP Header +20byte IPv4 Header +2byte ALP Header	1200 byte $2^{23}-1$ PRBS +8byte UDP Header +20byte IPv4 Header +2byte ALP Header
	Baseband Packet Length ($K_{payload}$)	47328 bits	PLP 0: 21408 bits PLP 1: 47328 bits	PLP 0: 21408 bits PLP 1: 25728 bits	21408 bits	43008 bits	1992 bits
BICM Parameters	PLP FEC type	BCH + 64800 LDPC	PLP 0: BCH+64800 LDPC PLP 1: BCH+64800 LDPC	PLP 0: BCH+64800 LDPC PLP 1: BCH+64800 LDPC	BCH + 64800 LDPC	BCH + 64800 LDPC	BCH + 16200 LDPC
	PLP FEC Codelength	64800	PLP 0: 64800 PLP 1: 64800	PLP 0: 64800 PLP 1: 64800	PLP 0: 64800	64800	16200
	PLP Code Rate	11/15	PLP 0: 5/15 PLP 1: 11/15	PLP 0: 5/15 PLP 1: 6/15	5/15	10/15	2/15
	PLP Modulation (QAM NUC)	64 16	PLP 0: QPSK PLP 1: 64	PLP 0: QPSK (core PLP) PLP 1: 16 (Enhanced PLP)	16	256	QPSK

	Parameter	Configuration 1	Configuration 2	Configuration 3	Configuration 4	Configuration 5	Configuration 6
Testing Reference	Verification and Validation test stream	VV600-P6S1	VV601-P6S1	VV602-P6S1	VV603-P6S1	VV604-P6S1	VV605-P6S1
	PLP Size	1467351 1440472	PLP 0: 259200 226800 PLP 1: 1198800	PLP 0: 1355209 PLP 1: 1355209	1133237	1467351 1440472	1133237
	PLP Time Interleaver mode	Convolutional	Hybrid	Convolutional	Convolutional	Convolutional	Convolutional
	PLP CTI Depth	1024 rows non-extended		1024 rows non-extended	1024 rows non-extended	1024 rows non-extended	1024 rows non-extended
	PLP CTI Memory ¹ [cells]	523776		523776	523776	523776	523776
	PLP HTI inter sub-frame		PLP 0: 0 PLP 1: 0				
	PLP HTI # TI Blocks		PLP 0: 1 PLP 1: 6				
	PLP HTI # Max FEC Blocks		PLP 0: 8 7 PLP 1: 120 111				
	PLP HTI # FEC Blocks		PLP 0: 8 7 PLP 1: 111				
	PLP HTI Memory ² [cells]		PLP 0: 291600 PLP 1: 226800				
	PLP HTI Cell interleaver		PLP 0: On PLP 1: On				
OFDM parameters	Frame Length Mode	Symbol aligned	Symbol aligned	Symbol aligned	Time aligned	Symbol aligned	Symbol aligned
	# Sub Frames	1	1	1	1	1	1
	# PLPs	1	2	2	1	1	1

¹ Convolutional Time Interleaver (CTI) memory = # rows * (# rows – 1)/2[cells]

² Hybrid Time Interleaver (HTI) depth = Block interleaver memory + Convolutional interleaver memory
 Block Interleaver memory = #rows * #FEC blocks = (LDPC codelength/log2(modulation) * #FEC blocks)
 Convolutional Interleaver memory = ((#rows/#TI blocks+1) * #FEC blocks) * (#TI blocks * (# TI blocks -1)/2)
 HTI depth = (#rows * #FEC blocks)+(((#rows/#TI blocks+1) * #FEC blocks) * (#TI blocks * (# TI blocks -1)/2))*2+1[cells]
 Time Interleaver depth = (#symbols/sub-frame) * (FFT size / (Baseband Sample Rate(BSR) / #PLPs)) * (1+GI Ratio)
 Time Interleaver depth = (Interleaver depth [cells] / NoC) * (FFT size/(BSR / #PLPs)) * (1+GI ratio)

	Parameter	Configuration 1	Configuration 2	Configuration 3	Configuration 4	Configuration 5	Configuration 6
Testing Reference	Verification and Validation test stream	VV600-P6S1	VV601-P6S1	VV602-P6S1	VV603-P6S1	VV604-P6S1	VV605-P6S1
	LDM	off	off	On	off	Off	Off
	LDM injection level	0	0	-4dB	0	0	0
	Channel Bonding	Off	Off	Off	Off	Off	Off
	MIMO/MISO/SISO	Subframe 1: SISO	Subframe 1: SISO	Subframe 1: SISO	Subframe 1: SISO	Subframe 1: MISO (N=64, M=2) SISO	Subframe 1: SISO
	FFT Size	Subframe 1: 32K	Subframe 1: 32K	Subframe 1: 16K	Subframe 1: 8K	Subframe 1: 32K	Subframe 1: 8K
	Guard Interval	Subframe 1: GI5_1024(148usec)	Subframe 1: GI5_1024(148usec)	Subframe 1: GI5_1024(148usec)	Subframe 1: GI6_1536(222usec)	Subframe 1: GI5_1024(148usec)	Subframe 1: GI6_1536(222usec)
	NoC (# of data carriers)	Subframe 1: 27649 (reduced carriers =0)	Subframe 1: 27649 (reduced carriers =0)	Subframe 1: 13825 (reduced carriers =0)	Subframe 1: 6913 (reduced carriers =0)	Subframe 1: 27649 (reduced carriers =0)	Subframe 1: 6913 (reduced carriers =0)
	Scattered Pilot Pattern	Subframe 1: SP24_2	Subframe 1: SP24_2	Subframe 1: SP6_2	Subframe 1: SP4_2	Subframe 1: SP24_2	Subframe 1: SP4_2
	SP boost	Subframe 1: 2.43	Subframe 1: 2.43	Subframe 1: 1.7	Subframe 1: 1.51	Subframe 1: 2.43	Subframe 1: 1.51
	# Payload Symbols	Subframe 1: 54 53	Subframe 1: 54 53	Subframe 1: 108	Subframe 1: 189	Subframe 1: 54 53	Subframe 1: 189
	Subframe Length	Subframe 1: 264.0 msec	Subframe 1: 264.0 msec	Subframe 1: 272.0 msec	Subframe 1: 266.0 msec	Subframe 1: 264.0 msec	Subframe 1: 266.0 msec
	First Subframe Boundary Symbol	Subframe 1: Yes	Subframe 1: Yes	Subframe 1: Yes	Subframe 1: Yes	Subframe 1: Yes	Subframe 1: Yes
	Last Subframe Boundary Symbol	Subframe 1: Yes	Subframe 1: Yes	Subframe 1: Yes	Subframe 1: Yes	Subframe 1: Yes	Subframe 1: Yes
	PLP Multiplexing ³	Subframe 1: TDM	Subframe 1: TDM	Subframe 1: LDM	Subframe 1: TDM	Subframe 1: TDM	Subframe 1: TDM
	Channel Occupancy (Scheduler regulated)	Subframe 1: 100%	Subframe 1, PLP 0: 18% Subframe 1, PLP 1: 82%	Subframe 1: 100%	Subframe 1: 100%	Subframe 1: 100%	Subframe 1: 100%
	Frequency Interleaver	On	On	On	On	On	On
	PAPR	Off	Off	Off	Off	Off	Off
Preamble Parameters	L1 Basic Mode	Mode 3	Mode 1	Mode 1	Mode 1	Mode 3	Mode 1
	L1 Detail Mode	Mode 3	Mode 1	Mode 1	Mode 1	Mode 3	Mode 1

³ PLP_ID, PLP_Size, PLP_Type, PLP_Start, Num_subsllices and subslice_Interval settings may vary.

	Parameter	Configuration 1	Configuration 2	Configuration 3	Configuration 4	Configuration 5	Configuration 6
Testing Reference	Verification and Validation test stream	VV600-P6S1	VV601-P6S1	VV602-P6S1	VV603-P6S1	VV604-P6S1	VV605-P6S1
	FFT	32K	32K	16K	8K	32K	8K
	Reduced Carriers	0	0	0	0	0	0
	Guard Interval	GI5_1024	GI5_1024	GI5_1024	GI6_1536	GI5_1024	GI6_1536
	SP_Dx	12	12	6	4	12	4
	# Preamble Symbols	1	1	1	2	1	2
	Frame Length ⁴	266 ms	266 ms	276.5185 ms	275 ms	266 ms	270.8148 ms
	Data Rate [Mbps] ⁵	15.8204 15.815	PLP 0: 0.6439 PLP 1: 19.2159	PLP 0: 0.32373 PLP 1: 7.7812	5.4447	28.7527	1.0289
	Approximate SNR ⁶ under AWGN channel [dB] (considering power boosting)	9.9 dB	PLP 0: -1.3 PLP 1: 14.7	PLP 0: 1.7 PLP 1: 10.3	3.4	17.5	-4.9

Gray shaded rows are calculation results given by respective parameter choices.

⁴ Frame Length = Bootstrap Length (2ms) + Preamble Length + Subframe Length = 2ms + (FFT_size_preamble + GI_preamble)*#preamble_symbols/6912 ms + (FFT_size_payload + GI_payload)*#payload_symbols/6912 ms. For example, frame length for configuration 1 = 2ms + (32768+1024)*1/6912 ms + (32768+1024)*53/6912 ms = 266ms

⁵ Data Rate [Mbps] = PLP_Size*Code_rate*log2(constellation size)*BCH_efficiency/Frame_length. For example, data rate for Configuration 1 = ~~1440445~~1440472*11/15*log2(16)*{(64800*11/15-192)/(64800*11/15)}/266ms = 15.82 Mbps.

⁶ For approximate SNR calculation, SNR threshold should be first obtained without pilot boosting. Then, SNR normalization according to pilot boosting should be performed. For example, the required SNR for configuration 1 is calculated by two steps: 1) SNR threshold = 9.5023 dB, 2) power normalization according to pilot boosting = 9.5032 dB + 10*log10(31648.70/28822.33) = 9.9 dB

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