

CTA Standard

Audio Format Extensions

CTA-861.5

September 2018

**Consumer
Technology
Association™**

NOTICE

Consumer Technology Association (CTA)TM Standards, Bulletins and other technical publications are designed to serve the public interest through eliminating misunderstandings between manufacturers and purchasers, facilitating interchangeability and improvement of products, and assisting the purchaser in selecting and obtaining with minimum delay the proper product for his particular need. Existence of such Standards, Bulletins and other technical publications shall not in any respect preclude any member or nonmember of the Consumer Technology Association from manufacturing or selling products not conforming to such Standards, Bulletins or other technical publications, nor shall the existence of such Standards, Bulletins and other technical publications preclude their voluntary use by those other than Consumer Technology Association members, whether the standard is to be used either domestically or internationally.

Standards, Bulletins and other technical publications are adopted by the Consumer Technology Association in accordance with the American National Standards Institute (ANSI) patent policy. By such action, the Consumer Technology Association does not assume any liability to any patent owner, nor does it assume any obligation whatever to parties adopting the Standard, Bulletin or other technical publication.

This document does not purport to address all safety problems associated with its use or all applicable regulatory requirements. It is the responsibility of the user of this document to establish appropriate safety and health practices and to determine the applicability of regulatory limitations before its use.

This document is copyrighted by the Consumer Technology Association (CTA)TM and may not be reproduced, in whole or part, without written permission. Federal copyright law prohibits unauthorized reproduction of this document by any means. Organizations may obtain permission to reproduce a limited number of copies by entering into a license agreement. Requests to reproduce text, data, charts, figures or other material should be made to the Consumer Technology Association (CTA)TM.

(Formulated under the cognizance of the CTA **R4 Video Systems Committee**.)

Published by
©CONSUMER TECHNOLOGY ASSOCIATION 2018
Technology & Standards Department
www.cta.tech

All rights reserved

FOREWORD

This standard was developed by the Consumer Technology Association's R4.8 DTV Interface Subcommittee.

(This page intentionally left blank.)

CONTENTS

FOREWORD	1
1 Scope.....	5
2 References	5
2.1 Normative References.....	5
2.1.1 Normative Reference List	5
2.1.2 Normative Reference Acquisition	5
2.2 Informative References	5
2.2.1 Informative Reference List.....	5
2.2.2 Informative Document Acquisition	5
2.3 Compliance Notation.....	6
2.4 Hexadecimal Notation	6
2.5 Bit Naming Conventions	6
2.6 Symbols and Abbreviations	6
3 Errata	7
4 System H 22.2.....	7
5 MPEG-H 3D Audio	8
6 HDMI Reference.....	8
7 Speaker Names	10

TABLES

Table 1 Additional Audio Format Code Extension Values (Data Byte 3)	7
Table 2 CTA Short Audio Descriptor for Audio Coding Extension Type Codes 4 to 6.....	7
Table 3 CTA Short Audio Descriptor for Audio Extension Type Code 11 (MPEG-H 3D Audio).....	8
Table 4 MPEG-H 3D Audio Level	8
Table 5 CTA Data Block Tag Codes	9
Table 6 Audio InfoFrame Format When Byte 4 is 0xFE	10
Table 7 Audio InfoFrame Format When Byte 4 is 0xFF.....	11
Table 8 Speaker Placement.....	13
Table 9 Audio InfoFrame Data Byte 4	15
Table 10 Speaker Allocation Data Block Payload.....	15
Table 11 Room Configuration Data Block	16
Table 12 SMPTE/CTA Audio Channel Description & Abbreviation Comparison.....	17
Table 13 SMPTE/CTA Audio Channel Assignment Comparison for CA=0x00-0x31	17
Table 14 Speaker Label Changes from CTA-861-F to CTA-861-G.....	18

Audio Format Extensions

1 Scope

This standard specifies Audio Format extensions to CTA-861-G [A].

The requirements of this standard are in addition to and complement CTA-861-G [A]. All devices compliant to CTA-861.5 shall also comply with CTA-861-G [A], except that this standard modifies Tables 29, 30, 33 through 35, 57, 64, 66, 69, 91, 140, 141, 143 and Figure 6 of CTA-861-G [A].

Any Errata and Extensions that apply to CTA-861-G [A], which were published after November 8th, 2016, also apply to this standard.

2 References

2.1 Normative References

The following standards contain provisions that, through reference in this text, constitute normative provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed here.

2.1.1 Normative Reference List

- A. CTA-861-G, A DTV Profile for Uncompressed High Speed Digital Interfaces, November 2016

2.1.2 Normative Reference Acquisition

ANSI/CTA Standards

- Global Engineering Documents, World Headquarters, 15 Inverness Way East, Englewood, CO USA 80112-5776; Phone 800-854-7179; Fax 303-397-2740; Internet: <http://global.ihs.com>; Email global@ihs.com

2.2 Informative References

The following documents contain information that is useful in understanding this standard. At the time of publication, the editions indicated were valid.

2.2.1 Informative Reference List

- B. HDMI, High-Definition Multimedia Interface Specification, Version 2.1, November 13, 2017

2.2.2 Informative Document Acquisition

HDMI

- HDMI Licensing Administrator, Inc., 550 S. Winchester Blvd, Suite 515, San Jose, CA 95128, USA; Internet <http://www.hdmi.org/>

2.3 Compliance Notation

As used in this document, “shall” denotes mandatory provisions of the standard. “Should” denotes a provision that is recommended but not mandatory. “May” denotes a feature whose presence does not preclude compliance and implementation of which is optional. “Optional” denotes items that may or may not be present in a compliant device.

2.4 Hexadecimal Notation

The characters 0x preceding numbers or letters A through F designate the following values as hexadecimal notation. All other numerical values are to be assumed decimal.

2.5 Bit Naming Conventions

The names of the individual bits of multi-bit data values are composed using a value's mnemonic followed by a bit number. The significance of each bit is indicated by the bit number according to little-endian convention (i.e. bit number 0 is the least significant).

Future bits begin with the mnemonic 'F' followed by a bit number, where bit numbers indicate location - not significance. Future bits shall be set to zero and ignored.

2.6 Symbols and Abbreviations

CTA	Consumer Technology Association
-----	---------------------------------

3 Errata

Table 1, shown below, modifies Table 33 in section 6.6.1 of CTA-861-G [A]:

CXT	Audio Coding Extension Type	Audio Stream Encoding Standard	Audio Stream Transport Standard
0x00	Refer to Audio Coding Type (CT) field in Data Byte 1		
0x01	Not in use		
0x02	Not in use		
0x03	Not in use		
0x04	MPEG-4 HE AAC	ISO/IEC 14496-3 [25]	IEC 61937-11 [21]
0x05	MPEG-4 HE AAC v2	ISO/IEC 23003-1 [26]	IEC 61937-11 [21]
0x06	MPEG-4 AAC LC	ISO/IEC 14496-3 [25]	IEC 61937-11 [21]
0x07	DRA	GB/T 22726 [38]	IEC 61937-12 [22]
0x08	MPEG-4 HE AAC + MPEG Surround	ISO/IEC 14496-3 [25], ISO/IEC 23003-1 [26]	IEC 61937-11 [21]
0x09	Reserved		
0x0A	MPEG-4 AAC LC + MPEG Surround	ISO/IEC 14496-3 [25], ISO/IEC 23003-1 [26]	IEC 61937-11 [21]
0x0B	MPEG-H 3D Audio	ISO/IEC 23008-3 [43]	IEC 61937-13 [46]
0x0C	AC-4	ETSI TS 103 190 [45]	IEC 61937-14 [47]
0x0D	L-PCM 3D Audio	IEC 60958-3 [48]	
0x0E – 0x1F	Reserved		

Table 1 Additional Audio Format Code Extension Values (Data Byte 3)

4 System H 22.2

Table 2, shown below, modifies Table 64 in section 7.5.2 of CTA-861-G, and a new paragraph is added:

Byte#	bits							
	7	6	5	4	3	2	1	0
1	F17=0	Audio Format Code=1111				Max Number of channels - 1		
2	F27=0	F26=0	F25=0	96 kHz	88.2 kHz	48 kHz	44.1 kHz	32 kHz
3	Audio Coding Extension Type Code					1024_TL	960_TL	22.2ch SysH

Table 2 CTA Short Audio Descriptor for Audio Coding Extension Type Codes 4 to 6

For audio format extension type code value 6 (decimal), bit 0 of Data Byte 3 (see Table 2) is used to indicate support for 22.2 multichannel sound. If ITU-R BS.2051 [105] System H 22.2 multichannel sound is supported, bit 0 shall be set to 1. For audio format extension type code values 4 & 5 (decimal), bit 0 of Data Byte 3 (see Table 2) is not used and shall be set to zero.

5 MPEG-H 3D Audio

Table 3, shown below, modifies Table 66 in section 7.5.2 of CTA-861-G, and a new Table, Table 4, as well as a new paragraph are added:

Byte#	bits							
	7	6	5	4	3	2	1	0
1	F17=0	Audio Format Code=1111				MPEG-H 3D Audio Level		
2	F27=0	192 kHz	176.4 kHz	96 kHz	88.2 kHz	48 kHz	44.1 kHz	32 kHz
3	Audio Coding Extension Type Code=0x0B					F32=0	F31=0	LCP

Table 3 CTA Short Audio Descriptor for Audio Extension Type Code 11 (MPEG-H 3D Audio)

Bit of Byte #3			MPEG-H 3DA Level
2	1	0	
0	0	0	Unspecified
0	0	1	Level 1
0	1	0	Level 2
0	1	1	Level 3
1	0	0	Level 4
1	0	1	Level 5
1	1	0	Reserved
1	1	1	Reserved

Table 4 MPEG-H 3D Audio Level

For audio format extension type code value 11 (decimal), bits 2, 1, and 0 of Data Byte 1 (see Table 3) are used to indicate the maximal supported MPEG-H 3D Audio level as defined in Table 4. Bit 0 of Data Byte 3 is used to indicate support for the MPEG-H 3D Audio Low Complexity Profile.

6 HDMI Reference

Table 5, shown below, modifies Table 57 in section 7.5 of CTA-861-G, and a new informative reference, [B], is added:

Extended Tag Codes	Type of Data Block
0	Video Capability Data Block
1	Vendor-Specific Video Data Block
2	VESA Display Device Data Block [100]
3	VESA Video Timing Block Extension
4	Reserved for HDMI Video Data Block
5	Colorimetry Data Block
6	HDR Static Metadata Data Block
7	HDR Dynamic Metadata Data Block
8...12	Reserved for video-related blocks
13	Video Format Preference Data Block
14	YCbCr 4:2:0 Video Data Block
15	YCbCr 4:2:0 Capability Map Data Block
16	Reserved for CTA Miscellaneous Audio Fields
17	Vendor-Specific Audio Data Block
18	HDMI Audio Data Block [B]
19	Room Configuration Data Block
20	Speaker Location Data Block
21...31	Reserved for audio-related blocks
32	InfoFrame Data Block (includes one or more Short InfoFrame Descriptors)
33...255	Reserved

Table 5 CTA Data Block Tag Codes

7 Speaker Names

Table 6, shown below, modifies Table 29 in section 6.6 of CTA-861-G:

InfoFrame Type Code	InfoFrame Type = 0x04							
InfoFrame Version Number	Version = 0x01							
Length of Audio InfoFrame	Length of Audio InfoFrame = 10							
Data Byte 1	CT3	CT2	CT1	CT0	F13=0	CC2	CC1	CC0
Data Byte 2	F27=0	F26=0	F25=0	SF2	SF1	SF0	SS1	SS0
Data Byte 3	F37=0	F36=0	F35=0	CXT4	CXT3	CXT2	CXT1	CXT0
Data Byte 4	1	1	1	1	1	1	1	0
Data Byte 5	DM_INH	LSV3	LSV2	LSV1	LSV0	F52=0	LFEPBL1	LFEPBL0
Data Byte 6	FLw/ FRw	F66=0 ¹	FLc/ FRc	BC	BL/BR	FC	LFE1	FL/FR
Data Byte 7	TpSiL/ TpSiR	SiL/ SiR	TpBC	LFE2	LS/RS	TpFC	TpC	TpFL/ TpFR
Data Byte 8	F87=0	F86=0	F85=0	F84=0	F83=0 ²	BtFL/ BtFR	BtFC	TpBL/ TpBR
Data Byte 9	F97=0	F96=0	F95=0	F94=0	F93=0	F92=0	F91=0	F90=0
Data Byte 10	F107=0	F106=0	F105=0	F104=0	F103=0	F102=0	F101=0	F100=0

Table 6 Audio InfoFrame Format When Byte 4 is 0xFE

¹ Use of F66 for RLC/RRC has been deprecated. Sources shall direct audio intended for these channels to BL/BR, which are logically the same speaker positions. Legacy Sources shall not set both RLC/RRC and BL/BR and shall not transmit data in both pairs of channels simultaneously. Legacy Sinks shall support reception of both RLC/RRC and BL/BR data; if data is sent simultaneously to both pairs of channels, Sinks shall ignore the data in RLC/RRC. Future use of F66 for other speaker positions is reserved.

² Use of F83 for TpLS/TpRS has been deprecated. Future use of F83 for other speaker positions is reserved.

Table 7, shown below, modifies Table 30 in section 6.6 of CTA-861-G:

InfoFrame Type Code	InfoFrame Type = 0x04							
InfoFrame Version Number	Version = 0x01							
Length of Audio InfoFrame	Length of Audio InfoFrame = 10							
Data Byte 1	CT3	CT2	CT1	CT0	F13=0	CC2	CC1	CC0
Data Byte 2	F27=0	F26=0	F25=0	SF2	SF1	SF0	SS1	SS0
Data Byte 3	F37=0	F36=0	F35=0	CXT4	CXT3	CXT2	CXT1	CXT0
Data Byte 4	1	1	1	1	1	1	1	1
Data Byte 5	DM_INH	LSV3	LSV2	LSV1	LSV0	F52=0	LFEPBL1	LFEPBL0
Data Byte 6	CID07	CID06	CID05	CID04	CID03	CID02	CID01	CID00
Data Byte 7	CID15	CID14	CID13	CID12	CID11	CID10	CID09	CID08
Data Byte 8	CID23	CID22	CID21	CID20	CID19	CID18	CID17	CID16
Data Byte 9	CID31	CID30	CID29	CID28	CID27	CID26	CID25	CID24
Data Byte 10	F107=0	F106=0	F105=0	F104=0	F103=0	F102=0	F101=0	F100=0

Table 7 Audio InfoFrame Format When Byte 4 is 0xFF

Figure 1 shown below, replaces Figure 6 in section 6.6.2 of CTA-861-G:

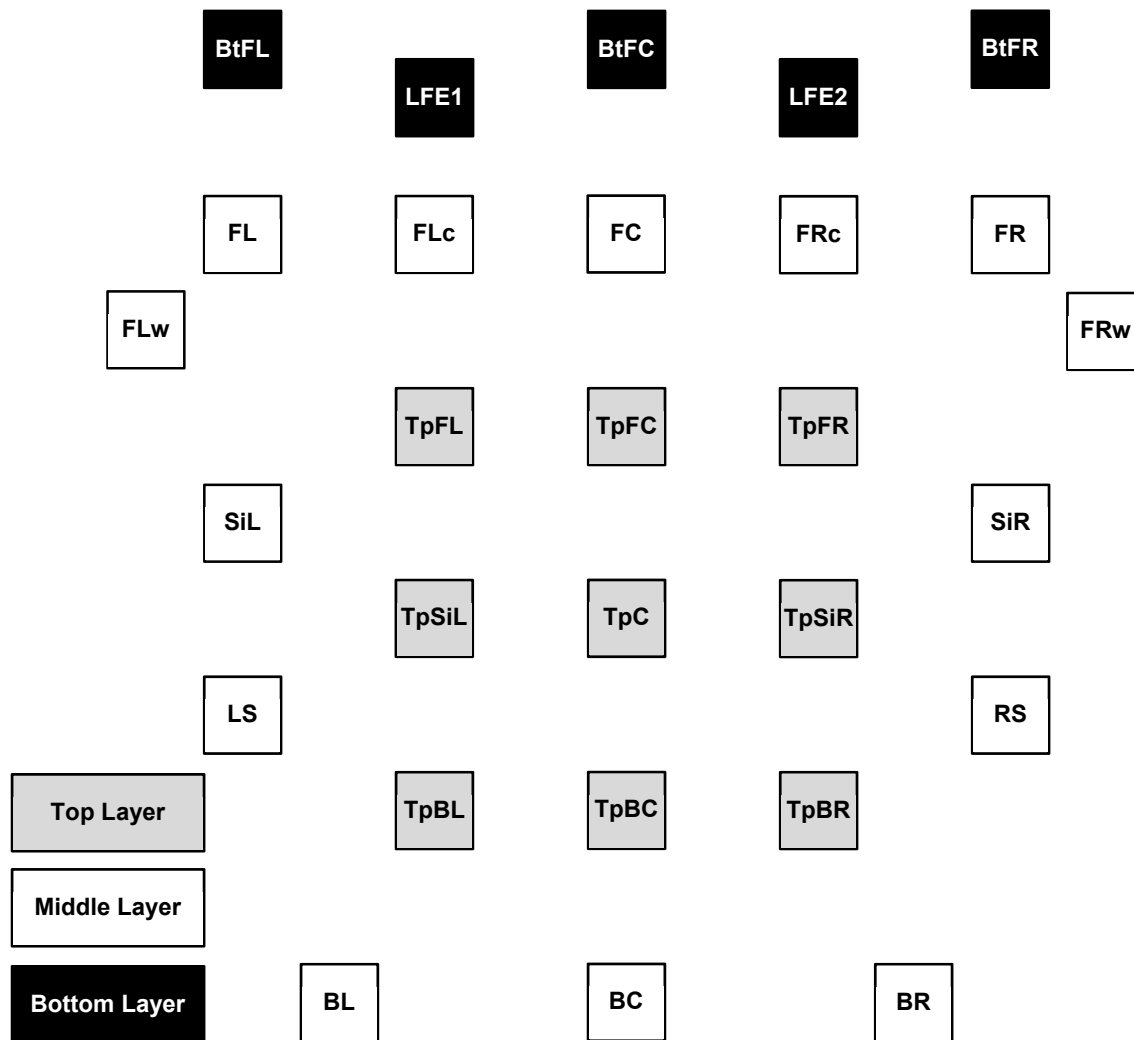


Figure 1 Speaker Placement

Table 8, shown below, modifies Table 34 in section 6.6.2 of CTA-861-G:

Label	Position Description	Code
FL	Front Left	0x00
FR	Front Right	0x01
FC	Front Center	0x02
LFE1	Low Frequency Effects 1	0x03
BL	Back Left	0x04
BR	Back Right	0x05
FLc	Front Left of Center	0x06
FRc	Front Right of Center	0x07
BC	Back Center	0x08
LFE2	Low Frequency Effects 2	0x09
SiL	Side Left	0x0A
SiR	Side Right	0x0B
TpFL	Top Front Left	0x0C
TpFR	Top Front Right	0x0D
TpFC	Top Front Center	0x0E
TpC	Top Center	0x0F
TpBL	Top Back Left	0x10
TpBR	Top Back Right	0x11
TpSiL	Top Side Left	0x12
TpSiR	Top Side Right	0x13
TpBC	Top Back Center	0x14
BtFC	Bottom Front Center	0x15
BtFL	Bottom Front Left	0x16
BtFR	Bottom Front Right	0x17
FLw	Front Left Wide	0x18
FRw	Front Right Wide	0x19
LS	Left Surround	0x1A
RS	Right Surround	0x1B
	reserved	0x1C
	reserved	0x1D
	reserved	0x1E
	reserved	0x1F

Table 8 Speaker Placement

Table 9, shown below, modifies Table 35 in section 6.6.2 of CTA-861-G:

CA (binary)								CA (hex)	Channel Number							
7	6	5	4	3	2	1	0		8	7	6	5	4	3	2	1
0	0	0	0	0	0	0	0	0x00	-	-	-	-	-	-	FR	FL
0	0	0	0	0	0	0	1	0x01	-	-	-	-	-	LFE1	FR	FL
0	0	0	0	0	0	1	0	0x02	-	-	-	-	FC	-	FR	FL
0	0	0	0	0	0	1	1	0x03	-	-	-	-	FC	LFE1	FR	FL
0	0	0	0	0	1	0	0	0x04	-	-	-	BC	-	-	FR	FL
0	0	0	0	0	1	0	1	0x05	-	-	-	BC	-	LFE1	FR	FL
0	0	0	0	0	1	1	0	0x06	-	-	-	BC	FC	-	FR	FL
0	0	0	0	0	1	1	1	0x07	-	-	-	BC	FC	LFE1	FR	FL
0	0	0	0	1	0	0	0	0x08	-	-	RS	LS	-	-	FR	FL
0	0	0	0	1	0	0	1	0x09	-	-	RS	LS	-	LFE1	FR	FL
0	0	0	0	1	0	1	0	0x0A	-	-	RS	LS	FC	-	FR	FL
0	0	0	0	1	0	1	1	0x0B	-	-	RS	LS	FC	LFE1	FR	FL
0	0	0	0	1	1	0	0	0x0C	-	BC	RS	LS	-	-	FR	FL
0	0	0	0	1	1	0	1	0x0D	-	BC	RS	LS	-	LFE1	FR	FL
0	0	0	0	1	1	1	0	0x0E	-	BC	RS	LS	FC	-	FR	FL
0	0	0	0	1	1	1	1	0x0F	-	BC	RS	LS	FC	LFE1	FR	FL
0	0	0	1	0	0	0	0	0x10	BR	BL ³	RS	LS	-	-	FR	FL
0	0	0	1	0	0	0	1	0x11	BR	BL	RS	LS	-	LFE1	FR	FL
0	0	0	1	0	0	1	0	0x12	BR	BL	RS	LS	FC	-	FR	FL
0	0	0	1	0	0	1	1	0x13	BR	BL	RS	LS	FC	LFE1	FR	FL
0	0	0	1	0	1	0	0	0x14	FRc	FLc	-	-	-	-	FR	FL
0	0	0	1	0	1	0	1	0x15	FRc	FLc	-	-	-	LFE1	FR	FL
0	0	0	1	0	1	1	0	0x16	FRc	FLc	-	-	FC	-	FR	FL
0	0	0	1	0	1	1	1	0x17	FRc	FLc	-	-	FC	LFE1	FR	FL
0	0	0	1	1	0	0	0	0x18	FRc	FLc	-	BC	-	-	FR	FL
0	0	0	1	1	0	0	1	0x19	FRc	FLc	-	BC	-	LFE1	FR	FL
0	0	0	1	1	0	1	0	0x1A	FRc	FLc	-	BC	FC	-	FR	FL
0	0	0	1	1	0	1	1	0x1B	FRc	FLc	-	BC	FC	LFE1	FR	FL
0	0	0	1	1	1	0	0	0x1C	FRc	FLc	RS	LS	-	-	FR	FL
0	0	0	1	1	1	0	1	0x1D	FRc	FLc	RS	LS	-	LFE1	FR	FL
0	0	0	1	1	1	1	0	0x1E	FRc	FLc	RS	LS	FC	-	FR	FL
0	0	0	1	1	1	1	1	0x1F	FRc	FLc	RS	LS	FC	LFE1	FR	FL
0	0	1	0	0	0	0	0	0x20	-	TpFC	RS	LS	FC	-	FR	FL
0	0	1	0	0	0	0	1	0x21	-	TpFC	RS	LS	FC	LFE1	FR	FL
0	0	1	0	0	0	1	0	0x22	TpC	-	RS	LS	FC	-	FR	FL
0	0	1	0	0	0	1	1	0x23	TpC	-	RS	LS	FC	LFE1	FR	FL
0	0	1	0	0	1	0	0	0x24	TpFR	TpFL	RS	LS	-	-	FR	FL
0	0	1	0	0	1	0	1	0x25	TpFR	TpFL	RS	LS	-	LFE1	FR	FL
0	0	1	0	0	1	1	0	0x26	FRw	FLw	RS	LS	-	-	FR	FL

³ Speaker positions RLC/RRC for CA=0x10-0x13 have been replaced by BL/BR, respectively. RLC/RRC have been deprecated as unique speaker locations as BL/BR are logically the same speaker locations. This does change the functionality of the Legacy mapping of speaker locations to transmission channels. For Table 35, this is a documentation change only.

CA (binary)								CA (hex)	Channel Number							
0	0	1	0	0	1	1	1	0x27	FRw	FLw	RS	LS	-	LFE1	FR	FL
0	0	1	0	1	0	0	0	0x28	TpC	BC	RS	LS	FC	-	FR	FL
0	0	1	0	1	0	0	1	0x29	TpC	BC	RS	LS	FC	LFE1	FR	FL
0	0	1	0	1	0	1	0	0x2A	TpFC	BC	RS	LS	FC	-	FR	FL
0	0	1	0	1	0	1	1	0x2B	TpFC	BC	RS	LS	FC	LFE1	FR	FL
0	0	1	0	1	1	0	0	0x2C	TpC	TpFC	RS	LS	FC	-	FR	FL
0	0	1	0	1	1	0	1	0x2D	TpC	TpFC	RS	LS	FC	LFE1	FR	FL
0	0	1	0	1	1	1	0	0x2E	TpFR	TpFL	RS	LS	FC	-	FR	FL
0	0	1	0	1	1	1	1	0x2F	TpFR	TpFL	RS	LS	FC	LFE1	FR	FL
0	0	1	1	0	0	0	0	0x30	FRw	FLw	RS	LS	FC	-	FR	FL
0	0	1	1	0	0	0	1	0x31	FRw	FLw	RS	LS	FC	LFE1	FR	FL
0	0	1	1	0	0	1	0	0x32	Reserved							
...																
1	1	1	1	1	1	0	1	0xFD								
1	1	1	1	1	1	1	0	0xFE	Channels delivered according to the Speaker Mask (see section 6.6.3)							
1	1	1	1	1	1	1	1	0xFF	Channels delivered according to Channel Index (see section 6.6.4)							

Table 9 Audio InfoFrame Data Byte 4

Table 10, shown below, modifies Table 69 in section 7.5.3 of CTA-861-G:

Byte#	bits							
	7	6	5	4	3	2	1	0
1	FLw/ FRw	F16=0 ⁴	FLc/FRc	BC	BL/BR	FC	LFE1	FL/FR
2	TpSiL/ TpSiR	SiL/SiR	TpBC	LFE2	LS/RS	TpFC	TpC	TpFL/ TpFR
3	F37=0	F36=0	F35=0	F34=0	F33=0 ⁵	BtFL/ BtFR	BtFC	TpBL/ TpBR

Table 10 Speaker Allocation Data Block Payload

⁴ Use of F16 for RLC/RRC has been deprecated. RLC/RRC are considered to be logically the same speaker positions as BL/BC. Legacy Sinks might use RLC/RRC instead of BL/BR; Sources shall route audio intended for RLC/RRC to BL/BR. See Table 29 and Table 35. Future use of F16 for other speaker positions is reserved.

⁵ Use of F33 for TpLS/TpRS has been deprecated. Future use of F33 for other speaker positions is reserved.

Table 11, shown below, modifies Table 91 in section 7.5.15 of CTA-861-G:

Byte #	7	6	5	4	3	2	1	0
1	Tag Code = 7			Length of following block payload (bytes)				
2	Extended Tag Code (0x13)							
3	Display	Speaker	SLD	Speaker Count				
SPM1	FLw/FRw	F46=0 ⁶	FLc/FRc	BC	BL/BR	FC	LFE1	FL/FR
SPM2	TpSiL/TpSiR	SiL/SiR	TpBC	LFE2	LS/RS	TpFC	TpC	TpFL/TpFR
SPM3	F67=0	F66=0	F65=0	F64=0	F63=0 ⁷	BtFL/BtFR	BtFC	TpBL/TpBR
MAX1	Xmax							
MAX2	Ymax							
MAX3	Zmax							
DISP1	DisplayX							
DISP2	DisplayY							
DISP3	DisplayZ							

Table 11 Room Configuration Data Block

⁶ Use of F46 for RLC/RRC has been deprecated. RLC/RRC are considered to be logically the same speaker positions as BL/BC. Legacy Sinks might use RLC/RRC instead of BL/BR; Sources shall route audio intended for RLC/RRC to BL/BR. See Table 29 and Table 35. Future use of F46 for other speaker positions is reserved.

⁷ Use of F63 for TpLS/TpRS has been deprecated. Future use of F63 for other speaker positions is reserved.

Table 12, shown below, is modifying Table 140 in annex K of CTA-861-G, and the preceding paragraph is modified:

Table 140 compares the speaker placements of SMPTE 2035 [63] to the CTA-861 standard. There is general agreement between 5.1 channels – although the exact audio channel descriptions and abbreviations are slightly different. CTA-861 channels that have no direct equivalents to SMPTE 2035 are not listed.

SMPTE 2035 [63]		CTA-861	
Audio channel	Abbreviation	Abbreviation	Audio Channel
Left	L	FL	Front Left
Center	C	FC	Front Center
Right	R	FR	Front Right
Left surround	LS	LS	Left Surround
Right surround	RS	RS	Right Surround
Low-frequency effects	LFE	LFE1	Low Frequency Effect
Mono surround	MS	BC	Back Center
Mono surround at a --3 dB level	MS (-3dB)		
Left total	Lt		
Right total	Rt		
Stereo left	Lo		
Stereo right	Ro		
Monophonic	M		
Freely usable	F		
Unassigned / unused	U		

Table 12 SMPTE/CTA Audio Channel Description & Abbreviation Comparison

Table 13, shown below, is modifying Table 141 in annex K of CTA-861-G:

Channel	SMPTE 2035	CTA-861
1	L	FL
2	R	FR
3	C	LFE1
4	LFE	FC
5	LS	LS, BC
6	RS	RS
7	Lt or Lo	BL, BC, FLc, SiL, TpFL, TpFC, TpBL, TpSiL, TpBC, BtFL, FLw
8	Rt or Ro	BR, LFE2, FRc, SiR, TpFR, TpC, TpBR, TpSiR, BtFC, BtFR, FRw

Table 13 SMPTE/CTA Audio Channel Assignment Comparison for CA=0x00-0x31

Table 14, shown below, is modifying Table 143 in annex Q of CTA-861-G:

ISO/IEC 62574 and CTA-861-G Label	Position Description	CTA-861-F Label
FL	Front Left	FL
FR	Front Right	FR
FC	Front Center	FC
LFE1	Low Frequency Effects 1	LFE
BL	Back Left	RLC
BR	Back Right	RRC
FLc	Front Left of Center	FLC
FRc	Front Right of Center	FRC
BC	Back Center	RC
LFE2	Low Frequency Effects 2	
SiL	Side Left	
SiR	Side Right	
TpFL	Top Front Left	FLH ⁸
TpFR	Top Front Right	FRH
TpFC	Top Front Center	FCH
TpC	Top Center	TC
TpBL	Top Back Left	
TpBR	Top Back Right	
TpSiL	Top Side Left	
TpSiR	Top Side Right	
TpBC	Top Back Center	
BtFC	Bottom Front Center	
BtFL	Bottom Front Left	
BtFR	Bottom Front Right	
FLw	Front Left Wide	FLW
FRw	Front Right Wide	FRW
LS	Left Surround	RL
RS	Right Surround	RR

Table 14 Speaker Label Changes from CTA-861-F to CTA-861-G

⁸ In IEC 62574 [42] labeling, Top Channels (Tp) are equivalent to Height (H) in various naming conventions.

Consumer Technology Association Document Improvement Proposal

If in the review or use of this document a potential change is made evident for safety, health or technical reasons, please email your reason/rationale for the recommended change to standards@CTA.tech.

Consumer Technology Association
Technology & Standards Department
1919 S Eads Street, Arlington, VA 22202
FAX: (703) 907-7693 standards@CTA.tech

**Consumer
Technology
Association™**