

**DENON®**

**AVC-A110**

**INTEGRATED NETWORK AV AMPLIFIER**

# **Surround Parameter Table**

# Sound modes and channel output

- This indicates the audio output channels or surround parameters that can be set.
- ◎ This indicates the audio output channels. The output channels depend on the settings of "Speaker Config."

Sound mode	Channel output																	
	Front L/R	Center	Surround L/R	Surround Back L/R	Front Wide L/R	Front Height L/R	Top Front L/R	Top Middle L/R	Top Rear L/R	Rear Height L/R	Surround Height L/R	Center Height	Top Surround	Front Dolby Atmos Enabled L/R	Surround Dolby Atmos Enabled L/R	Back Dolby Atmos Enabled L/R	Subwoofer	
Direct/Pure Direct (2-channel)	○																	◎*4
Direct/Pure Direct (Multi-channel)	○	◎	◎	◎*5	◎*5	◎*5	◎*5	◎*5	◎*5	◎*5	◎*5	◎*5	◎*5	◎*5	◎*5	◎*5	◎*5	◎
DSD Direct (2-channel)	○																	◎*4
DSD Direct (Multi-channel)	○	◎	◎															◎
Stereo	○																	◎
Dolby Atmos	○	◎	◎	◎	◎	◎	◎	◎	◎	◎				◎	◎	◎		◎
Dolby TrueHD	○	◎	◎	◎*5														◎
Dolby Digital Plus	○	◎	◎	◎*5														◎
Dolby Digital	○	◎	◎															◎
Dolby Surround *1	○	◎	◎	◎*6	◎*7	◎	◎	◎	◎	◎				◎	◎	◎		◎
IMAX DTS:X	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
IMAX DTS	○	◎	◎*8	◎*8														◎
DTS:X	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
DTS-HD	○	◎	◎	◎*5	◎*5													◎
DTS Express	○	◎	◎	◎														◎
DTS 96/24	○	◎	◎	◎														◎
DTS Surround	○	◎	◎	◎														◎
DTS Neural:X *2	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
DTS Virtual:X *3	○	◎	◎	◎														◎

- \*1 The applicable sound mode includes "Dolby Surround" and sound modes that have "+Dolby Surround" in the sound mode name.
- \*2 The applicable sound mode includes "DTS Neural:X" and sound modes that have "+Neural:X" in the sound mode name.
- \*3 The applicable sound mode includes "DTS Virtual:X" and sound modes that have "+Virtual:X" in the sound mode name.
- \*4 Audio is output when "Bass" - "Subwoofer Mode" in the menu is set to "LFE+Main".

- \*5 A signal for each channel contained in an input signal is output as audio.
- \*6 Audio is not output when the "Surround Parameter" - "Speaker Virtualizer" in the menu is set to "On" and "Speaker Config." - "Surr. Back" in the menu is set to "1 spkr".
- \*7 Audio is not output when the "Surround Parameter" - "Speaker Virtualizer" is set to "On".
- \*8 When "Speaker Config." - "Surr. Back" is set to "2 spkrs", "Speaker Config." - "Center" is set to "Large" or "Small", and sound mode is set to "IMAX DTS", surround audio is output from the surround back speaker. Audio is not output from the surround speaker.

Sound mode	Channel output																	
	Front L/R	Center	Surround L/R	Surround Back L/R	Front Wide L/R	Front Height L/R	Top Front L/R	Top Middle L/R	Top Rear L/R	Rear Height L/R	Surround Height L/R	Center Height	Top Surround	Front Dolby Atmos Enabled L/R	Surround Dolby Atmos Enabled L/R	Back Dolby Atmos Enabled L/R	Subwoofer	
Auro-3D	○	⊙	⊙	⊙		⊙				⊙*9	⊙	⊙	⊙	⊙*10	⊙*10	⊙*10	⊙	
Auro-2D Surround	○	⊙	⊙	⊙													⊙	
Multi Ch In	○	⊙	⊙	⊙*5													⊙	
MPEG-H	○	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	
Multi Ch Stereo	○	⊙	⊙	⊙	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙
Rock Arena	○	⊙	⊙	⊙	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙
Jazz Club	○	⊙	⊙	⊙	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙
Mono Movie	○	⊙	⊙	⊙	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙
Video Game	○	⊙	⊙	⊙	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙
Matrix	○	⊙	⊙	⊙	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙*11	⊙
Virtual	○																⊙	

\*5 A signal for each channel contained in an input signal is output as audio.

\*9 For the best Auro-3D experience Surround Height speakers are recommended, however you may substitute Rear Height speakers from a Dolby Atmos speaker setup in place of Surround Height speakers.

\*10 For the best Auro-3D experience Front Height and Surround Height speakers are recommended, however you may substitute Dolby Atmos Enabled speakers.

\*11 Audio is output from the speakers specified in the "Surround Parameter" - "Speaker Select" settings.

# Sound modes and surround parameters

Sound mode	Surround Parameter														
	Cinema EQ	Loudness Management *2	Dynamic Compression *3	Dialog Control *4	Low Frequency Effects *5	Delay Time	Effect Level	Room Size	Speaker Select *6	Center Spread	Speaker Virtualizer *7	DTS Neural:X	IMAX	IMAX Audio Settings	High Pass Filter *8
Direct/Pure Direct (2-channel) *1		<input type="radio"/>	<input type="radio"/>												
Direct/Pure Direct (Multi-channel) *1		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>										
DSD Direct (2-channel)															
DSD Direct (Multi-channel)															
Stereo		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>										
Dolby Atmos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>						<input type="radio"/>				
Dolby TrueHD	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>										
Dolby Digital Plus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>										
Dolby Digital	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>										
Dolby Surround	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>							<input type="radio"/>	<input type="radio"/>				
IMAX DTS:X	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
IMAX DTS	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>							<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
DTS:X	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
DTS-HD	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>							<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
DTS Express	<input type="radio"/>				<input type="radio"/>								<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
DTS 96/24	<input type="radio"/>				<input type="radio"/>								<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
DTS Surround	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>								<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
DTS Neural:X	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>												
DTS Virtual:X	<input type="radio"/>		<input type="radio"/>												
Auro-3D	<input type="radio"/>				<input type="radio"/>										
Auro-2D Surround	<input type="radio"/>				<input type="radio"/>										
Multi Ch In	<input type="radio"/>				<input type="radio"/>										
MPEG-H	<input type="radio"/>				<input type="radio"/>										
Multi Ch Stereo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				<input type="radio"/>						
Rock Arena		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						
Jazz Club		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						
Mono Movie		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						
Video Game		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						
Matrix		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			<input type="radio"/>						
Virtual		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>										

\*1 During playback in Pure Direct mode, the surround parameters are the same as in Direct mode.

\*2 This item can be selected when a Dolby Digital, Dolby Digital Plus, Dolby TrueHD or Dolby Atmos signal is played.

\*3 This item can be selected when a Dolby Digital, Dolby Digital Plus, Dolby TrueHD, Dolby Atmos, DTS:X or DTS signal is played.

\*4 This item can be selected when a DTS:X signal that is compatible with the Dialog Control function is input.

\*5 This item can be selected when a Dolby Digital or DTS signal or DVD-Audio is played.

\*6 This item can be selected when Height, Ceiling or Dolby Atmos Enabled speakers are used.

\*7 This item can be set when any Height, Ceiling or Dolby Atmos Enabled speakers are not used, or Surround speakers are not used.

\*8 This item can be selected when "Surround Parameter" - "IMAX Audio Settings" in the menu is set to "Manual".

Sound mode	Surround Parameter						Dialog Enhancer	Tone *9	Subwoofer Level Adjust *10	Audyssey				Restorer *15	Bass Sync *16
	Low Pass Filter *8	Subwoofer Mode *8	Auro-Matic 3D Preset	Auro-Matic 3D Strength	Auro-3D Mode	Subwoofer				MultiEQ® XT32 *11*12*13	Dynamic EQ *13*14	Dynamic Volume *13*14	Audyssey LFC™ *13*14		
Direct/Pure Direct (2-channel) *1						○*17			○*17						
Direct/Pure Direct (Multi-channel) *1									○						○
DSD Direct (2-channel)						○*17			○*17						
DSD Direct (Multi-channel)									○						○
Stereo						○*18	○	○	○*18	○	○	○	○	○	○
Dolby Atmos							○	○	○	○	○	○	○	○	○
Dolby TrueHD							○	○	○	○	○	○	○	○	○
Dolby Digital Plus							○	○	○	○	○	○	○	○	○
Dolby Digital							○	○	○	○	○	○	○	○	○
Dolby Surround							○	○	○	○	○	○	○	○	○
IMAX DTS:X	○	○					○	○	○	○	○	○	○		○
IMAX DTS	○	○					○	○	○	○	○	○	○		○
DTS:X							○	○	○	○	○	○	○		○
DTS-HD							○	○	○	○	○	○	○		○
DTS Express							○	○	○	○	○	○	○		○
DTS 96/24							○	○	○	○	○	○	○		○
DTS Surround							○	○	○	○	○	○	○		○
DTS Neural:X							○	○	○	○	○	○	○		○
DTS Virtual:X							○	○	○	○	○	○	○	○	
Auro-3D			○*19	○*19	○*20		○	○	○	○	○	○	○	○	○
Auro-2D Surround							○	○	○	○	○	○	○	○	○
Multi Ch In							○	○	○	○	○	○	○		○
MPEG-H							○	○	○	○	○	○	○		○
Multi Ch Stereo							○	○	○	○	○	○	○	○	○
Rock Arena							○	○	○	○	○	○	○	○	○
Jazz Club							○	○	○	○	○	○	○	○	○
Mono Movie							○	○	○	○	○	○	○	○	○
Video Game							○	○	○	○	○	○	○	○	○
Matrix							○	○	○	○	○	○	○	○	○
Virtual								○	○	○	○	○	○	○	○

\*1 During playback in Pure Direct mode, the surround parameters are the same as in Direct mode.

\*8 This item can be selected when "Surround Parameter" - "IMAX Audio Settings" in the menu is set to "Manual".

\*9 This item cannot be set when "Dynamic EQ" is set to "On".

\*10 This item cannot be set when "Speaker Config." - "Subwoofer" in the menu is set to "None".

\*11 This item cannot be set when Audyssey® Setup (Speaker Calibration) has not been performed.

\*12 This item cannot be selected when a DTS:X format with a sampling frequency of over 48 kHz is input.

\*13 This item cannot be set when sound mode is "DTS Virtual:X" or sound mode that have "+Virtual:X" in the sound mode name.

\*14 This item cannot be set when "MultiEQ® XT32" in the menu is set to "Off".

\*15 This item can be set when the input signal is analog, PCM 48 kHz or 44.1 kHz.

\*16 This can be set when the LFE signal is included in the input signal.

\*17 This setting is available when "Bass" - "Subwoofer Mode" in the menu is set to "LFE+Main".

\*18 This item can be set when "Speaker Config." - "Front" is set to "Small" or "Bass" - "Subwoofer Mode" is set to "LFE+Main".

\*19 This can be set if the input signal does not contain an Auro-3D signal or if the input Auro-3D signal does not contain Front Height channels.

\*20 This can be set if the input signal contains an Auro-3D signal.

# Types of input signals, and corresponding sound modes

- This indicates the default sound mode.
- This indicates the selectable sound mode.

Sound mode	NOTE	2-channel signal								Multi-channel signal																	
		Dolby TrueHD	Dolby Digital Plus	Dolby Digital (EX)	DTS-HD	DTS Express	DTS	Analog / PCM	DSD (Super Audio CD)	Dolby Atmos	Dolby TrueHD	Dolby Digital Plus	Dolby Digital (EX)	IMAX DTS:X	IMAX DTS	DTS:X	DTS-HD	DTS Express	DTS ES Dscrt6.1	DTS ES Mtrx6.1	DTS	Auro-3D	PCM multi-channel	MPEG-H	DSD (Super Audio CD)		
Direct																											
Direct		○	○	○	○	○	○	○*2		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
DSD Direct									○																	○	
Pure Direct																											
Pure Direct		○	○	○	○	○	○	○		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
DSD Pure Direct									○																	○	
Stereo		○	○	○	○	○	○	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Dolby Surround																											
Dolby Atmos	*1									●																	
Dolby TrueHD		○								○*3	○													○*4			
Dolby Digital Plus			○							○*5																	
Dolby Digital				○																							
Dolby (D+) (HD) + Dolby Surround											●	●	●										○*4				
Dolby (D+) (HD) + Neural:X											○	○	○										○*4				
Dolby Surround		●	●	●	○	○	○	○	○																		

\*1 This item can be selected when using any of the Surround Back, Front Height, Top Front, Top Middle, Top Rear, Rear Height, Front Dolby, Surround Dolby or Back Dolby speaker. It can also be selected when the "Surround Parameter" - "Speaker Virtualizer" setting is turned "On".

\*2 The default sound mode for the AirPlay playback is "Direct".

\*3 This can be selected when the Dolby Atmos signal contains the Dolby TrueHD signal.

\*4 This item can be selected if the Auro-3D signal contains Dolby TrueHD.

\*5 This can be selected when the Dolby Atmos signal contains the Dolby Digital Plus signal.

Sound mode	NOTE	2-channel signal								Multi-channel signal																	
		Dolby TrueHD	Dolby Digital Plus	Dolby Digital (EX)	DTS-HD	DTS Express	DTS	Analog / PCM	DSD (Super Audio CD)	Dolby Atmos	Dolby TrueHD	Dolby Digital Plus	Dolby Digital (EX)	IMAX DTS:X	IMAX DTS	DTS:X	DTS-HD	DTS Express	DTS ES Dscrt6.1	DTS ES Mtrx6.1	DTS	Auro-3D	PCM multi-channel	MPEG-H	DSD (Super Audio CD)		
DTS Surround																											
IMAX DTS:X														●*7													
IMAX DTS														○*7								○*8					
DTS:X MSTR / DTS:X													○*9		●												
DTS-HD MSTR					○*10								○*9			○*10							○*11				
DTS-HD HI RES					○*12								○*9			○*12											
DTS Express						○							○*9				○										
DTS ES Dscrt 6.1	*6																	○									
DTS ES Mtrx 6.1	*6																		○								
DTS 96/24								○*13											○			○*13					
DTS Surround							○							○*9					○		○	○					
IMAX DTS + Neural:X														●*7								○*8					
IMAX DTS / IMAX DTS:X + Virtual:X													○*7	○*7								○*8					
DTS (-HD) + Dolby Surround													○			○	○	○	○	○	○	○	○*11				
DTS (-HD) + Neural:X													○*9			●*14	●*14	●*14	●*14	●*14	●*14	○*11					
DTS (-HD) / DTS:X + Virtual:X													○*9	○*9	○*15	○	○	○	○	○	○	○	○*11				
DTS Neural:X		○	○	○	●*14	●*14	●*14	○	○																		
DTS Virtual:X					○	○	○	○	○																		

\*6 This item can be selected when surround back speakers are used.

\*7 Selectable when "Surround Parameter" - "IMAX" is set to "Auto" in the menu.

\*8 Selectable when "Surround Parameter" - "IMAX" is set to "On" in the menu and a 48 kHz sampling frequency DTS 5.1 channel signal is being input.

\*9 Selectable when "Surround Parameter" - "IMAX" is set to "Off". (Selectable sound modes vary depending on the type of input signal).

\*10 This item can be selected when the input signal is DTS-HD Master Audio.

\*11 This item can be selected if the Auro-3D signal contains DTS-HD Master Audio.

\*12 This item can be selected when the input signal is DTS-HD Hi Resolution.

\*13 This item can be selected when the input signal is DTS 96/24.

\*14 This item cannot be selected when a DTS(-HD) format with a sampling frequency of over 48 kHz is input.

\*15 This item cannot be selected when a DTS:X format with a sampling frequency of over 48 kHz is input.

Sound mode	NOTE	2-channel signal									Multi-channel signal																
		Dolby TrueHD	Dolby Digital Plus	Dolby Digital (EX)	DTS-HD	DTS Express	DTS	Analog / PCM	DSD (Super Audio CD)	Dolby Atmos	Dolby TrueHD	Dolby Digital Plus	Dolby Digital (EX)	IMAX DTS:X	IMAX DTS	DTS:X	DTS-HD	DTS Express	DTS ES Dscrt6.1	DTS ES Mtrx6.1	DTS	Auro-3D	PCM multi-channel	MPEG-H	DSD (Super Audio CD)		
Auro-3D																											
Auro-3D	*16	○	○	○	○	○	○	○	○		○	○	○		○	○	○	○	○	○	○	○	○		○		
Auro-2D Surround	*16	○	○	○	○	○	○	○	○		○	○	○		○	○	○	○	○	○	○	○	○		○		
Multi Ch In																											
Multi Ch In																						○*17	●		●		
Multi Ch In 7.1	*6																							○*18			
Multi In + Dolby Surround																								○		○	
Multi In + Neural:X																								○		○	
Multi In + Virtual:X																								○		○	
MPEG-H																											
MPEG-H																									●		
Original sound mode																											
Multi Ch Stereo		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Rock Arena		○	○	○	○	○	○	○	○	○*19	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Jazz Club		○	○	○	○	○	○	○	○	○*19	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Mono Movie		○	○	○	○	○	○	○	○	○*19	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Video Game		○	○	○	○	○	○	○	○	○*19	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Matrix		○	○	○	○	○	○	○	○	○*19	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Virtual		○	○	○	○	○	○	○	○	○*19	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

\*6 This item can be selected when surround back speakers are used.

\*16 This item cannot be selected if the sampling frequency of the input signal is 32 kHz.

\*17 This item can be selected if the Auro-3D signal contains multi channel PCM.

\*18 This item can be selected when the input signals contain surround back signals.

\*19 This can be selected when the Dolby Atmos signal contains the Dolby TrueHD or Dolby Digital Plus signal.