

H04S

STEREOPHONIC SYSTEMS

Definition statement

This place covers:

Signal processing or circuitry for stereophonic sound reproduction, using loudspeakers or headphones, or for stereophonic sound capturing.

References

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Circuits or components specially adapted for stereophonic broadcast systems	H04H 20/47
Broadcast systems for the distribution of stereophonic information	H04H 20/88
Circuits or components specially adapted for stereophonic broadcast receiving	H04H 40/36

Informative references

Attention is drawn to the following places, which may be of interest for search:

Sound processing hardware for games using an electronically generated display having two or more dimensions	A63F 2300/209
Speech or audio signal analysis-synthesis techniques for redundancy reduction, e.g. in vocoders; Coding or decoding of speech or audio signals, e.g. for compression or expansion, using source-filter models or psychoacoustic analysis	G10L 19/00
Multichannel audio signal coding and decoding, i.e. using interchannel correlation to reduce redundancies, e.g. joint-stereo, intensity-coding, matrixing	G10L 19/008
Information storage on discs or tapes	G11B
Low frequency amplifiers, e.g. audio preamplifiers	H03F 3/181
Power amplifiers using a combination of several semiconductor amplifiers	H03F 3/211
Combinations of amplifiers using coupling networks with distributed constants	H03F 3/602
Combinations of amplifiers, e.g. multi-channel amplifiers for stereophonics	H03F 3/68
Remote control of amplification, tone, or bandwidth	H03G 1/02
Gain control	H03G 3/00
Tone control and equalizers	H03G 5/00
Compression or expansion	H03G 7/00
Combination of types of control	H03G 9/00
Multiplex systems in general	H04J
Stereophonic arrangements of loudspeakers, microphones or headphones	H04R 5/00

Special rules of classification

Classification of invention information and additional information is obligatory.

Further detail not provided for in any of the main groups is provided for in the groups of Indexing Codes [H04S 2400/00](#) and [H04S 2420/00](#) and subgroups thereof. Classification is obligatory.

Indexing Code symbols of the type [H04S 2400/00-H04S 2420/13](#) should be used to classify information relevant for the invention, although it need not be invention information.

Indexing Code groups [H04S 2400/00](#) and [H04S 2420/00](#) should not be used for classification.

H04S 1/00

Two-channel systems ([H04S 5/00](#), [H04S 7/00](#) take precedence)

Definition statement

This place covers:

Non-adaptive circuits, i.e. manually adjustable or static, signal processing, e.g. for enhancing the sound image or the spatial distribution, or for sound capture in two-channel systems.

References

Limiting references

This place does not cover:

Pseudo-stereophonic systems	H04S 5/00
Indicating arrangements of stereophonic systems; Control arrangements, e.g. balance control of stereophonic systems	H04S 7/00

Special rules of classification

Multi-channel, i.e. more than two input channels, sound reproduction with two speakers wherein the multi-channel information is substantially preserved is not to be classified under [H04S 1/00](#) but under [H04S 3/00](#), [H04S 5/00](#) or [H04S 7/00](#) using the Indexing Code [H04S 2400/01](#).

Further detail is covered by the subgroups of Indexing Code group [H04S 2400/00](#) and [H04S 2420/00](#). Classification is obligatory.

H04S 1/002

{Non-adaptive circuits, e.g. manually adjustable or static, for enhancing the sound image or the spatial distribution (control circuits for electronic adaptation of the sound field [H04S 7/30](#))}

Definition statement

This place covers:

Electronic sound processing for enhancing the sound image or the spatial distribution, wherein the processing itself is independent on the input signal or its properties.

See for example: WO2005009078

References

Limiting references

This place does not cover:

Control circuits for electronic adaptation of the sound field, i.e. electronic sound processing automatically adaptable in dependence of the input signal or some of its properties, e.g. by using an adaptive circuit or a look-up table, for changing the sound field, e.g. the spatial distribution	H04S 7/30
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H04S 1/007

{in which the audio signals are in digital form (data reduction aspects thereof based on psychoacoustics [G10L 19/02](#))}

References

Limiting references

This place does not cover:

Data reduction aspects of digital stereo signals based on psychoacoustics	G10L 19/02
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H04S 3/00

Systems employing more than two channels, e.g. quadraphonic ([H04S 5/00](#), [H04S 7/00](#) take precedence)

Definition statement

This place covers:

Non-adaptive circuits, i.e. manually adjustable or static, for signal processing, e.g. enhancing the sound image or the spatial distribution, or for sound capture in multi-channel systems.

References

Limiting references

This place does not cover:

Pseudo-stereophonic systems	H04S 5/00
Indicating arrangements of stereophonic systems; Control arrangements, e.g. balance control of stereophonic systems	H04S 7/00

Special rules of classification

Further detail is covered by the subgroups of Indexing Code groups [H04R 2203/00](#), [H04S 2400/00](#) and [H04S 2420/00](#). Classification is obligatory.

H04S 3/002

{Non-adaptive circuits, e.g. manually adjustable or static, for enhancing the sound image or the spatial distribution (control circuits for electronic adaptation of the sound field [H04S 7/30](#))}

Definition statement

This place covers:

Electronic sound processing for enhancing the sound image or the spatial distribution, wherein the processing itself is independent on the input signal or its properties.

See for example: US5740253

References

Limiting references

This place does not cover:

Control circuits for electronic adaptation of the sound field, i.e. electronic sound processing automatically adaptable in dependence of the input signal or some of its properties, e.g. by using an adaptive circuit or a look-up table, for changing the sound field, e.g. the spatial distribution	H04S 7/30
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H04S 3/006

{in which a plurality of audio signals are transformed in a combination of audio signals and modulated signals, e.g. CD-4 systems (for broadcasting [H04H 20/88](#), [H04B 1/1646](#))}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

For broadcasting	H04B 1/1646 , H04H 20/89
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H04S 3/008

{in which the audio signals are in digital form, i.e. employing more than two discrete digital channels, e.g. Dolby Digital, Digital Theatre Systems [DTS] (data reduction aspects thereof based on psychoacoustics [G10L 19/02](#))}

Definition statement

This place covers:

See for example: US2002159611

References

Limiting references

This place does not cover:

Data reduction aspects of digital stereo signals based on psychoacoustics	G10L 19/02
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Reduction of bandwidth of signals in transmission systems using psychoacoustic properties of the ear, e.g. masking effect.	H04B 1/665
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H04S 3/02

of the matrix type, i.e. in which input signals are combined algebraically, e.g. after having been phase shifted with respect to each other

Definition statement

This place covers:

E.g. Dolby Surround, Pro-Logic, incl. AC-1

See for example: US5771295

H04S 5/00

Pseudo-stereo systems, e.g. in which additional channel signals are derived from monophonic signals by means of phase shifting, time delay or reverberation

Definition statement

This place covers:

Systems wherein additional channels are generated from the existing channels to improve the spatial sound reproduction, e.g. wave field synthesis or virtual surround sound, or the spatial sound capture, e.g. 4-channel ambisonic capture to 7.1-channel

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Directing or focusing sound using electrical steering of transducer arrays, e.g. beam steering	G10K 11/34
Arrangements for producing a reverberation or echo sound	G10K 15/08

Special rules of classification

When classifying in [H04S 5/00](#), it is desirable to add the indexing codes of groups [H04S 2400/00](#) and [H04S 2420/00](#).

H04S 5/005

{of the pseudo five- or more-channel type, e.g. virtual surround}

Definition statement

This place covers:

See for example: US5295189

H04S 7/00

Indicating arrangements; Control arrangements, e.g. balance control

Definition statement

This place covers:

Sound field processing, i.e. electronic adaptation of the sound field e.g. automatic set-up, adaptation with respect to listener position, frequency adjustment, reverberation adaptation, sound object positioning.

Indicating of the sound field.

References

Limiting references

This place does not cover:

Non-adaptive circuits, i.e. manually adjustable or static, for signal processing, e.g. enhancing the sound image or the spatial distribution, of for sound capture in stereophonic systems	H04S 1/00 , H04S 3/00
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Arrangements for producing a reverberation or an echo sound	G10K 15/08
Tone control circuits in amplifiers per se	H03G 5/00
Circuits for coupling gramophone pick-up, recorder output, or microphone to receiver, e.g. for Hi-Fi systems or audio/video combinations by remote control	H04B 1/202
Circuits for correcting the frequency response of transducers	H04R 3/04
Adaptation of reverberation in public address systems	H04R 27/00
Monitoring or testing arrangements for transducers, loudspeakers, microphones or public address systems; Visual indication of acoustic signal levels	H04R 29/00

Special rules of classification

Further detail is covered by the subgroups of Indexing Code groups [H04R 2203/00](#), [H04S 2400/00](#) and [H04S 2420/00](#). Classification is obligatory.

Groups [H04S 7/30](#) - [H04S 7/40](#) do not correspond to former or current IPC groups. The concordance ECLA : IPC for these groups is as follows: [H04S 7/30-H04S 7/40](#) : [H04S 7/00](#)

H04S 7/30

{Control circuits for electronic adaptation of the sound field (non-adaptive circuits, i.e. manually adjustable or static, for enhancing the sound image or the spatial distribution [H04S 1/002](#), [H04S 3/002](#))}

Definition statement

This place covers:

Electronic sound processing automatically adaptable in dependence of the input signal or some of its properties, e.g. by using an adaptive circuit or a look-up table, for changing the sound field, e.g. the spatial distribution.

See for example: EP1473971

References

Limiting references

This place does not cover:

Non-adaptive circuits, i.e. manually adjustable or static, for enhancing the sound image or the spatial distribution	H04S 1/002 , H04S 3/002
Telephonic conference arrangements	H04M 3/56
Video conference systems	H04N 7/15

H04S 7/301

{Automatic calibration of stereophonic sound system, e.g. with test microphone}

Definition statement

This place covers:

See for example: US5666424 and US2002159611

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Automatic gain control	H03G 3/20
Automatic tone control or bandwidth control in amplifiers	H03G 5/16

H04S 7/302

{Electronic adaptation of stereophonic sound system to listener position or orientation ([H04S 7/301](#) takes precedence)}

Definition statement

This place covers:

See for example: WO0241664, US6108430 and EP1482763

References

Limiting references

This place does not cover:

Automatic calibration of stereophonic sound system, e.g. with test microphone	H04S 7/301
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H04S 7/303

{Tracking of listener position or orientation}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Head tracking input arrangements for transferring data to be processed into a form capable of being handled by the computer	G06F 3/012
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H04S 7/305

{Electronic adaptation of stereophonic audio signals to reverberation of the listening space ([H04S 7/301](#) takes precedence; arrangements for producing a reverberation or echo sound [G10K 15/08](#); for public address systems [H04R 27/00](#), [H04R 29/00](#))}

Definition statement

This place covers:

See for example: EP1341399 (room) and EP1482763 (vehicle)

References

Limiting references

This place does not cover:

Automatic calibration of stereophonic sound system, e.g. with test microphone	H04S 7/301
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Measuring reverberation time, i.e. room acoustic measurements	G01H 7/00
Arrangements for producing a reverberation or echo sound	G10K 15/08
For public address systems	H04R 27/00

H04S 7/307

{Frequency adjustment, e.g. tone control ([H04S 7/301](#) takes precedence; circuits for correcting the frequency response of transducers [H04R 3/04](#); tone control circuits in amplifiers per se [H03G 5/00](#))}

Definition statement

This place covers:

See for example: US5325435.

References

Limiting references

This place does not cover:

Automatic calibration of stereophonic sound system, e.g. with test microphone	H04S 7/301
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Tone control in general	H03G 5/00
Circuits for correcting the frequency response of transducers	H04R 3/04

H04S 7/308

{Electronic adaptation dependent on speaker or headphone connection}

Definition statement

This place covers:

See for example: WO2006033058

H04S 7/40

{Visual indication of stereophonic sound image (visual indication of individual signal levels [H04R 29/008](#))}

Definition statement

This place covers:

See for example: WO2006033058 and US2004264704

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Indicating measured values	G01D 7/00
Arrangements for displaying electric variables or waveforms	G01R 13/00
Visual indication of individual signal levels	H04R 29/008

H04S 2400/01

Multi-channel, i.e. more than two input channels, sound reproduction with two speakers wherein the multi-channel information is substantially preserved

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Aspects of down-mixing multi-channel audio to configurations with lower numbers of playback channels, e.g. 7.1 -> 5.1	H04S 2400/03
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Special rules of classification

NOT to be given for [H04S 1/00](#) since no multi-channel sound information is present according to [H04S 1/00](#). See for example: US6470087, US5912976

H04S 2400/03

Aspects of down-mixing multi-channel audio to configurations with lower numbers of playback channels, e.g. 7.1 -> 5.1 ([H04S 2400/01](#) takes precedence)

References

Limiting references

This place does not cover:

Multi-channel, i.e. more than two input channels, sound reproduction with two speakers wherein the multi-channel information is substantially preserved	H04S 2400/01
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See for example: US2008049943 (e.g. paragraphs [0098] - [0099] and Figs.6A and 6B).

H04S 2400/05

Generation or adaptation of centre channel in multi-channel audio systems

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Generation of additional channels in pseudo stereo system per se	H04S 5/00
Adaptation of sound field per se	H04S 7/30

See for example: EP0526136

H04S 2400/07

Generation or adaptation of the Low Frequency Effect [LFE] channel, e.g. distribution or signal processing

Definition statement

This place covers:

See for example: EP0854660 (Figs.1-3; distribution, and Figs.5 and 6; signal processing).

H04S 2400/09

Electronic reduction of distortion of stereophonic sound systems

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Reduction of non-linear distortion in audio amplifiers	H03F 1/3264
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See for example: US6519344

H04S 2400/11

Positioning of individual sound objects, e.g. moving airplane, within a sound field ([H04S 2420/13](#) takes precedence)

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Positioning of sound field itself, e.g. balance and fading	H04S 7/302
Aspects of volume control, not necessarily automatic, in two- and multi-channel sound systems	H04S 2400/13

See for example: US6519344

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Sound object	audio object, i.e. acoustic representation of a sound producing entity in a sound field
Sound source	real or virtual loudspeaker

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- "virtual sound sources", "virtual sound objects" and "virtual loudspeakers"

H04S 2400/13

Aspects of volume control, not necessarily automatic, in stereophonic sound systems

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Control of amplification per se	H03G
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See for example: US2004213421 and DE4202609

H04S 2400/15

Aspects of sound capture and related signal processing for recording or reproduction

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Spatial or contructional arrangements of microphones	H04R 5/027
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See for example: US2005141728 (Figs. 3, 5 and 6) and US2006206221 (Figs.1 and 3)

Special rules of classification

Documents only relating to spatial or construction arrangements of microphones should not receive this Indexing Code group

H04S 2420/01

Enhancing the perception of the sound image or of the spatial distribution using head related transfer functions [HRTF's] or equivalents thereof, e.g. interaural time difference [ITD] or interaural level difference [ILD]

Definition statement

This place covers:

For example: US6466913, US6243476, DE102004035046.

H04S 2420/03

Application of parametric coding in stereophonic audio systems

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Parametric coding as such	G10L 19/008
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See for example: WO2005094125

H04S 2420/05

Application of the precedence or Haas effect, i.e. the effect of first wavefront, in order to improve sound-source localisation

Definition statement

This place covers:

For example: EP1439732, EP1771039.

H04S 2420/07

Synergistic effects of band splitting and sub-band processing

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Digital filter banks	H03H 17/0266
Crossover filters for loudspeakers	H04R 3/14

See for example: EP1471765, US4953216 and DE19632734

Special rules of classification

The mere band splitting or presence of a filter bank (e.g. FFT, FIR, ...) should not be classified in this Indexing Code group

H04S 2420/11

Application of ambisonics in stereophonic audio systems

Definition statement

This place covers:

See for example: US3997725 and US5757927

H04S 2420/13

Application of wave-field synthesis in stereophonic audio systems

Definition statement

This place covers:

See for example: WO2004103022

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Control systems	encompasses adaptive systems
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