



WG4 of DVD Forum introduces the Recommendation for DVD-Audio (DVD Specifications for Read-Only Disc Part4: AUDIO SPECIFICATIONS), and hopes that the recommendation would become generalized practical guides for the spread of DVD-Audio World.

The document is composed of 7 chapters as follows:

1. Recommendation for Terminology
2. Recommendation for Button name and its function
3. Recommendation for Bonus Group
4. Recommendation for Silent Cell
5. Recommendation for multi-channel and stereo compatible contents (added at 2nd edition)
6. Recommendation for automatic playback of AMG Menu (added at 2nd edition)
7. Recommendation for video display function of players (added at 2nd edition)

Note:

- 1) Recommended terms and button names described below are for English-speaking and Japanese-speaking countries, so they may be changeable according to the situation of other countries.
- 2) Recommended button functions, operation manners, etc. described below should be generally applied worldwide.

Revision history

- January 18, 2000 :The first edition containing chapters 1, 2, 3, 4 and Annex.
- May 28, 2002 :The second edition with chapters 5, 6 and 7 added.

1. Recommendation for Terminology

Following recommended terms indicate functions or structure, specific to DVD-Audio.

Recommended term in English	Recommended term in Japanese	Corresponding technical term in AUDIO SPECIFICATIONS
Album	アルバム	Volume
Group	グループ	Title Group
Bonus Group	ボーナスグループ	Hidden Group
Track	トラック	Track
Index	インデックス	Index
Spotlight	スポットライト	Spotlight
Album Text	アルバムテキスト	ATXTDT
Track Text	トラックテキスト	RTXTDT
Slideshow	スライドショー	Slideshow
Browsable pictures	ブラウザブルピクチャー or ブラウザブル静止画	Browsable pictures

Other terms are available to be adopted instead of above recommended terminology, in cases where contents of discs require some specialized usage-oriented terms. Some examples are shown in Annex attached at the end of this Recommendation.



2. Recommendation for Button name and its function

The following are the recommended button names and their functions, specific to DVD-Audio. They should be commonly implemented on Player and/or its Remote control unit according to rules described in the following table.

In the following table,

Button Type indicates as follows:

Type A indicates the recommended button, which should be always implemented as a single button.

Type B indicates the recommended button, which should be implemented as a single button if its function is necessary as one of functions.

Player Type indicates as follows:



Type1 indicates the player which behaves as DVD-Video Player when it plays back DVD-Video Disc and as VCAP (see Type2) when it plays back DVD-Audio Disc (Note: It is also recommended that Type 1 Player should satisfy Recommendation for DVD-Video published by DVD Forum.).

Type2 indicates VCAP specified in AUDIO SPECIFICATIONS.

Type3 indicates AOP specified in AUDIO SPECIFICATIONS.

Button Type	Recommended name in English	Recommended name in Japanese	Recommended function	For Type 1 player	For Type 2 player	For Type 3 player
A	TOP MENU	トップメニュー	This button has two functions as follows: 1) Call AMG menu 2) Resume from AMG menu Above functions are alternated when user presses the button.	Applied	Applied	Not applied
A	MENU	メニュー	(Note1)	Not applied	Not applied	Not applied
A	ANGLE	アングル or アングル切り替え	This button has the function, which changes the status to make Angle change possible. The angle should be changed by this button itself and may be changed by other buttons.	Applied	Applied	Not applied
A	RETURN	リターン	This button has two functions as follows: 1) Go back to the specified position according to Go Up PGC number described in AMG_PGCI during the presentation of AMGM. 2) Skip to the ASV specified as Home DLIST during the presentation of a Group.	Applied	Applied	Not applied
A	ENTER	決定	This button has the function, which activates the selected button on screen.	Applied	Applied	Not applied
B	SETUP	セットアップ or 初期設定	This button has the function, which starts Player's initial setting function, such as Language selection.	Applied	Applied	Applied
B	SUBTITLE	字幕	This button has the function, which changes the status to make Subtitle change possible. The subtitle should be changed by this button itself and may be changed by other buttons.	Applied	Applied	Not applied



B	SUBTITLE ON/OFF	字幕 入/切	This buttons has the function, which turns on/off the display of the subtitle without stopping decoding of the subtitle. Therefore, even if this button turns off the subtitle, the forced display is available.	Applied	Applied	Not applied
B	AUDIO	音声	This button has the function, which changes the status to make Audio selection possible. The audio selection should be carried out by this button itself and may be carried out by other buttons. At least, the execution of Audio selection should be carried out at ATT boundary within Player's presentation capability.	Applied	Applied	Applied
B	PS/LB	PS/LB	This button has the function, which directly changes the display mode on 4:3 screen to Pan-scan or Letterbox.	Applied	Applied	Not applied
B	 (Note2)		This button has two functions as follows: 1) Skip to the previous Track or the next Track during the presentation of a Group. 2) Skip to the previous PG or the next PG during the presentation of AMGM.	Applied	Applied	Only applied for Function 1)
B	 (Note2)		This button has the function, which carries out the fast forward or fast reverse presentation.	Applied	Applied	Applied
B	Page	ページ	This button has the function, which skips to the previous ASV or the next ASV in Browsable display mode.	Applied (Note3)	Applied	Not applied

Note1:

In Recommendation for DVD-Video, Menu button is recommended as Type A button. However, in Recommendation for DVD-Audio, Menu button is recommended as a non-effective button. This means that Menu button of Type 1 player has no function for the presentation of DVD-Audio Disc, and Type 2 player and Type 3 player don't have Menu button.

Note2:

Only mark of the button is recommended. The name of the button may be different for each manufacturer, such as Prev/Next or Skip.

Note3:

For Type 1 Player, this button may be used as another function button for the presentation of DVD-Video disc.



3. Recommendation for Bonus Group

The following are the recommendations regarding Bonus Group.

3.1 For 4 digit number

The recommended terms for 4 digit number that enable a player to play back Bonus Group are as follows:

Recommended name in English	Recommended name in Japanese	Corresponding technical term in DVD-Audio SPECIFICATIONS
Key Number	キー番号 or キーナンバー	4 digit number

3.2 For Disc Jacket and Booklet, etc.

When a disc has a Bonus Group,

- Some notation for existence of the Bonus Group should be described on Disc Jacket, etc.
- Indication for the Group number of the Bonus Group should be described on Disc Jacket, etc.
- Instruction how to get Key Number should be introduced on Disc Jacket, etc.

3.3 For Player

(1) Manner to enter Key Number

- Generally, the function to enter the Key Number would be implemented as Ten-key function.
- Once the playback of Bonus Group is done, there may be no need to re-enter the number for accessing the Bonus Group while the input of Key Number is valid on Player.

(2) Manner to display

In the case that Player has the capability of playing back Bonus Group and of displaying the number of Groups, Group number, and etc.,

- When the total number of Groups is displayed, the number including a Bonus Group should be displayed.
- The Group Number of the Bonus Group should be displayed while the Bonus Group is being played back.



4. Recommendation for Silent Cell

Silent Cell is the Cell containing silent audio data, and specified as Index 0. Silent Cell is available only for Audio Only Title with AOBs. The following is the recommendation regarding Silent Cell for Player.

4.1 Manner to play back

- When Tracks are sequentially played back, the whole of the Silent Cell is played back.
- When Track search occurs, the whole or the part of the Silent Cell of the target Track may not be played back. In this case, ASV of which display period terminates within the period of Silent Cell may not be displayed.

4.2 Manner to display

- The playback period of Silent Cell should not be included in "Track Time", and the count of "Track Time" should be started from the playback of the first Audio Cell of a Track.
- The playback period of Silent Cells should be included in "Group Total Time (or Album Total Time)".



5. Recommendation for multi-channel and stereo compatible contents *(new)*

The DVD-Audio Specifications provide two compatible stereo playback methods for multi-channel music; one uses “Down-mix” and the other uses “Audio Selection”. These methods offer users proper stereo 2-channel presentation of multi-channel oriented music.

In order to make compatible stereo playback really effective for users, the following disc configurations and player behavior are recommended.

5.1 Recommendation for discs

When a Group supports both stereo 2-channel and multi-channel playback, the Group should be composed of tracks corresponding to one of the following types.

(1) A track in single PGC

(1a) A track coded with LPCM multi-channel data

In this case, the track should be configured as follows:

- “Stereo playback mode” is set to “permitted”, and
- Valid down-mix coefficients are specified, namely, overflow (clipping of signals) or underflow (too low-level signals) should be avoided in the down-mix.

(1b) A track coded with MLP multi-channel data

In this case, the track should be configured as follows:

- 2-channel data portion: L_0/R_0 stream is included in the multi-channel data.
- The 2-channel portion is encoded with valid down-mix coefficients, namely, overflow (clipping of signals) or underflow (too low-level signals) should be avoided at the encoding process.

(2) A track in a PGC Block

In this case, the track should be configured as follows:

- A track contains both multi-channel and stereo 2-channel data in the form of Audio Selection (i.e. a PGC Block)
- Audio Selection #1 is always used for multi-channel data and #2 is always used for stereo 2-channel data.
Note: It is recommended that the disc jacket or booklet indicates the relationship between Audio Selection Number and data type.
- For each Track in a PGC Block, the playback time (track duration) of each of the pair of contents (e.g. the stereo 2-channel and the multi-channel data) differs by no more than five seconds:

$$|(\text{PG_PB_TM of PG\#n in PGC\#1}) - (\text{PG_PB_TM of PG\#n in PGC\#2})| \leq \text{five seconds for each \#n of PG number.}$$

Note: A PGC Block may also contain other combination types of two PGCs such as a combination of multi-channel content coded by MLP and multi-channel content coded by LPCM. This recommendation should be applied to all types.

Note: In cases (1a), (1b), and (2) above, multi-channel content should not include musically-meaningless channels such as no-sound channels, etc. In order to avoid user’s confusion, this recommendation should be applied to all cases where multi-channel contents are stored in a disc.



5.2 Recommendation for players

When playing back an Audio Selection Group configured as described in 5.1 (2) above:

- For either a 2-channel player or a multi-channel player whose analog output is set to 2-channel presentation mode, it is recommended that the player preset U_ASLN to the Audio Selection number which corresponds to stereo 2-channel data.
- For a multi-channel player whose analog output is set to multi-channel presentation mode, it is recommended that the player preset U_ASLN to the Audio Selection number which corresponds to multi-channel data.

Note1: This recommendation should be applied to 2-channel players, and multi-channel players which have a function to select analog output between 2-channel and multi-channel presentation mode.

Note2: Some user operations and/or intention (SETUP, etc.) may cause U_ASLN to be changed during the presentation of AMGM, a Group or in Stop State. These changes should be given priority over this recommendation.

Reference:

U_ASLN is the parameter to indicate User's intended Audio Selection number. U_ASLN is changed by either User's pre-setting, User's selection or Navigation Command in AMGM.

The recommendation above provides Users with a convenient method to pre-set Audio Selection Group.

6. Recommendation for automatic playback of AMG Menu *(new)*

For user's convenience, it is recommended that AMG Menu be presented after loading a disc into a player, when all the following conditions are satisfied:

- AMG Menu exists, and
- "AP flag" of AP_INF in AMGI_MAT is set to '0b' (This disc may be played back automatically), and
- The player is a Video Capable Audio Player, and a video output signal is being provided.

Note1: User's intentions, such as operations to directly access a Group, should be given priority over this recommendation.

Note2: For the following types of players this recommendation should be applied with appropriate modification, or may not be applied:

- A player which has a function like multi-disc changer/carousel system
- A player which is used in some special conditions like in a car

7. Recommendation for video display function of players *(new)*

When a Video Capable Audio Player has a function to turn off its video output, the following are recommended:

- The player should have a function to indicate the state of turn on/off.
- The player's operation manual, etc. should provide an explanation of the player behavior when video output is turned off.



Annex

The following table shows some examples of specialized usage terms.

Recommended term in English	Examples of usage term
Group	Stereo Playlist, Multi-Channel Playlist, etc.
Bonus Group	Bonus Tracks, etc.
Index	Music Markers, etc.
Spotlight	Highlight, etc.
Album Text	Song name, Artist name, Catalogue, Liner notes, Credits, etc.
Track Text	Lyrics, Credits listed by song, etc.
Slideshow	Linked Lyrics, etc.
Browsable pictures	Gallery, etc.