



Picture Archiving and Sharing Standard

A Joint Initiative

PASS(EVERPLAY)

Receiving/Playback

System Requirements



VERSION 1.101

February, 2006

Fuji Photo Film Co., Ltd., Konica Minolta Photo Imaging, Inc., Eastman Kodak Company

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Document History

Version	Date	Change
1.10	December, 2005	
1.101	February 22, 2006	- Document name changed to PASS(EVERPLAY) Receiving/Playback System Requirements.

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1.0. PASS Overview

The Picture Archiving and Sharing Standard (PASS) is a digital imaging industry initiative that will allow consumers to easily save, print, playback, and share digital images in ways that were not accomplished easily or reliably before.

The current version of the PASS specification suite includes:

- PASS Logical Disc Specification 1.10 (LDS)

- PASS Originating and Authoring System Requirements 1.10 (O/A)

- PASS Receiving and Playback System Requirements 1.10 (R/P)

The LDS includes a complete overview, definitions, and reference list for all documents in the specification suite. The LDS also includes XML references that are necessary for understanding the other documents. Readers are encouraged to become familiar with the LDS prior to reviewing this document.

2.0. Introduction to the PASS Receiving and Playback System Requirements

The Receiving and Playback System Requirements specification (R/P) defines the requirements for the use of a PASS Digital Volume disc in terms of functional receiving and playback activities. The R/P does not define any particular user-interface; however, to illustrate the functionality requirements, some examples may be provided.

2.1. Organization of the Receiving and Playback System Requirements

PASS uses special descriptor files ('manifests') that are defined by the MusicPhotoVideo Specification (MPV) of Optical Storage Technology Association (OSTA). These manifest files are defined in detail in the PASS Logical Disc Specification.

The R/P specifically describes

- a) Locating and interpreting PASS-defined manifest files;
- b) Displaying individual assets;
- c) Playing PASS albums; and
- d) Locating and selecting assets to be used for non-PASS services.

3.0. R/P system components

The R/P system utilizes consumer devices that read PASS Digital Volumes. R/P systems can take many forms, such as: kiosks, PCs, DVD players, portable image viewers, etc. The R/P system specification describes the functionality of those devices that can read and display PASS Digital Volumes.

3.1. Receiving component

The primary task of the receiving component is to locate and read the PASS index manifest file (PASSIDX.PVM) to determine how the media was written. The R/P then has access to all other manifest files on the PASS Digital Volume. The R/P then has access to assets and presentation information by utilizing the index manifest file, default album manifest files, and custom album manifest files. The receiving system is responsible for the following functions:

- a) Locate and interpret the index manifest file
- b) Locate and interpret the all default manifest files
- c) Locate and interpret any existing custom manifest files

3.2. Playback component

The playback component of the R/P system fulfills the requirements of the consumer electronic systems that are designed to display PASS Digital Volume presentations. The responsibilities of the playback component include:

- a) Verify PASS asset file format compatibility
- b) Select and display entire PASS Digital Volumes as a selection display
- c) Display PASS asset files from each default or custom album as a selection display
- d) Display PASS asset files from each default or custom album as a slide show
- e) Display PASS asset files individually
- f) Display metadata for each PASS asset file

3.3. Print image selection component

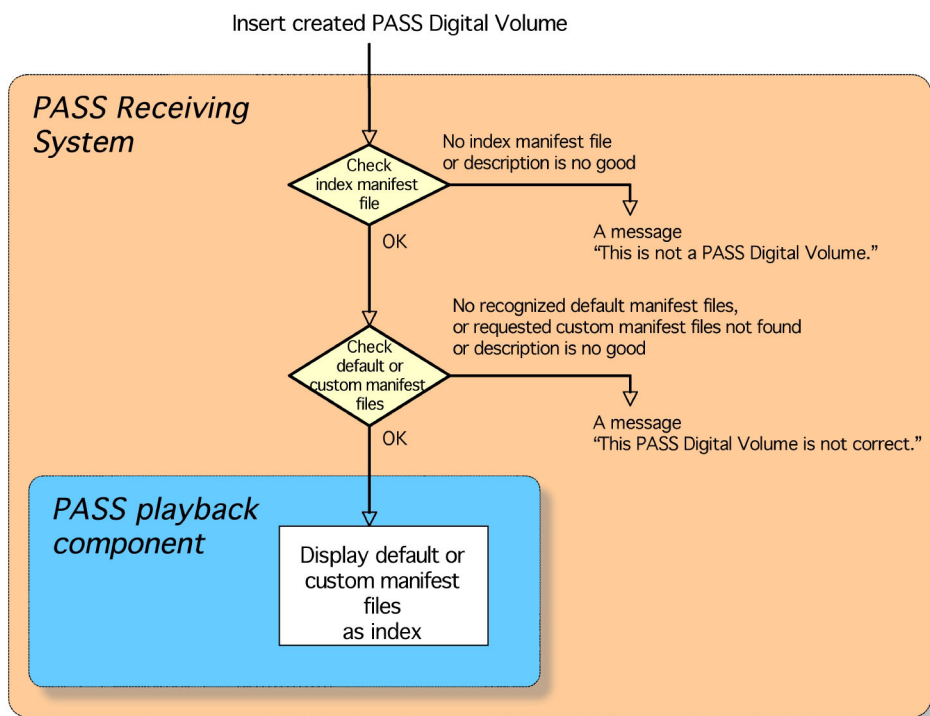
This optional component provides functions that allow the user to select still PASS asset files to place an order for prints.

4.0. Functional requirements for a PASS receiving component

4.1. Locate and interpret the index manifest file

The R/P must read and interpret the PASS index manifest file (PASSIDX.PVM), which is located at the root directory of the PASS Digital Volume.

Figure 1. R/P actions on insertion of PASS Digital Volume



4.2. Locate and interpret all default and custom manifest files

Upon locating and identifying the PASS index manifest file (1), a receiving system will begin processing the PASSIDX.PVM. The index manifest file contains references to at least one default album manifest file and any custom album manifest files (2). These manifest files contain the information necessary to display original PASS asset files and display files from the display screen directories and display thumbnail directories of that particular asset roll directory or display files from the shared assets directory (3A, 3B, 3C). Figure 2 illustrates the process sequence and the relationship between manifest files in an RDS defined structure.

Sequence and the relationships between the PASS manifest files

The diagram illustrates the structure and relationships between PASS manifest files and assets:

- PASS Digital Volume (PDV)** is the root of the structure.
- Index manifest file** (1) points to **PASSIDX.PVM**.
- Assets** are organized into two main groups:
 - AR20050519_XXXXXXX1** (Default album manifest file):
 - Assets: **AS20050519_XXXXXXX1.PVM**, **OR20050519_XXXXXXX1.jpg**, **OR20050519_XXXXXXX2.mpg**.
 - Manifests: **DISP_SCR** (linked to **TT20050519_XXXXXXX1.jpg**), **DISP_THB** (linked to **TT20050519_XXXXXXX1.jpg**).
 - AR20050519_XXXXXXX2** (Default album manifest file):
 - Assets: **AS20050519_XXXXXXX2.PVM**, **OR20050519_XXXXXXX1.jpg**, **OR20050519_XXXXXXX2.mpg**.
 - Manifests: **DISP_SCR** (linked to **TT20050519_XXXXXXX1.jpg**), **DISP_THB** (linked to **TT20050519_XXXXXXX1.jpg**).
- Custom album manifest file** (3B) points to **ALBUMS**, which includes:
 - SHARED**: **SH20050519_XXXXXXX3.jpg**, **TT20050519_XXXXXXX3.jpg**.
 - ALBUMS**: **AR20050519_XXXXXXX1.PVM**.

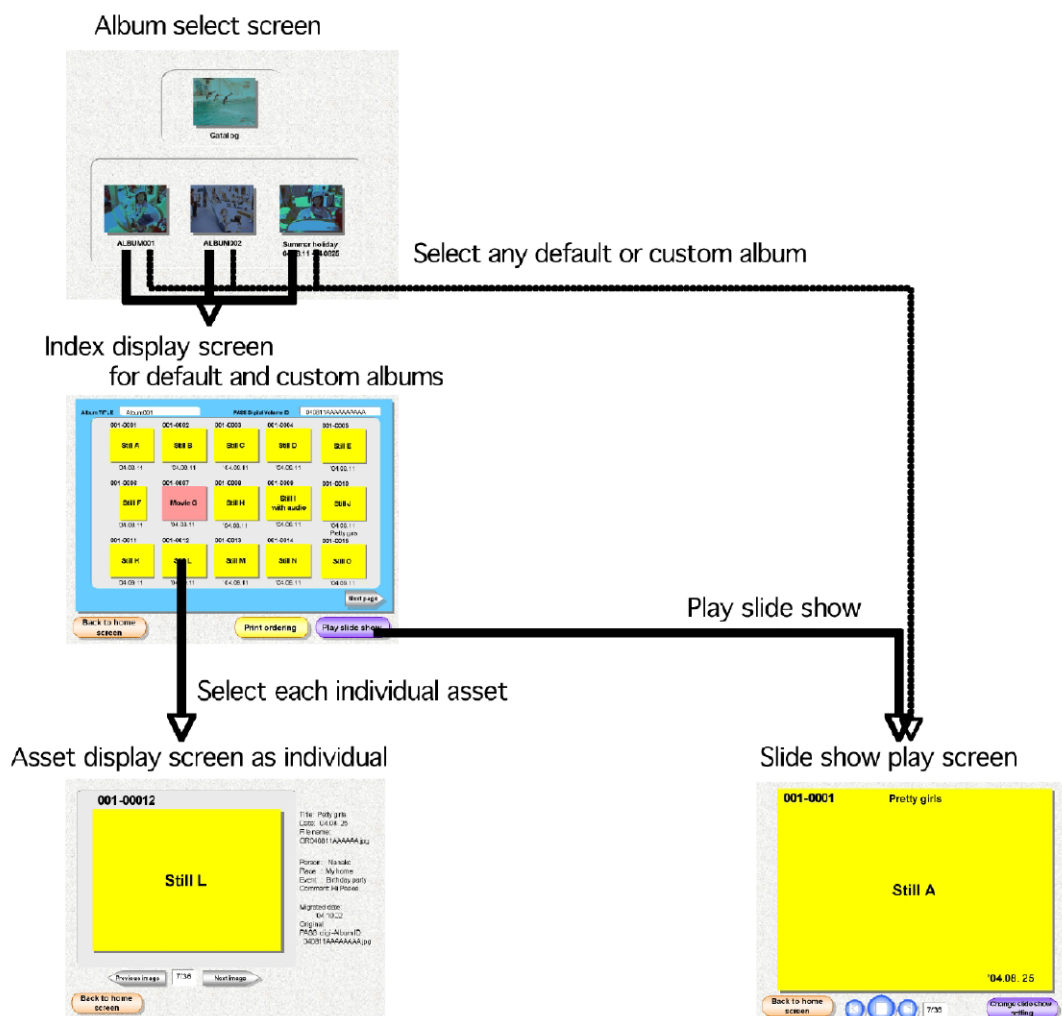
Arrows indicate the flow of data and relationships between these files and the underlying assets.

5.0. Functional requirements for a PASS playback component

A PASS playback component utilizes the index manifest file, default album manifest files, and custom album manifest files in the PASS Digital Volume to locate asset files. The playback component must also decode individual assets (simple and compound).

Figure 3 (below) describes an example of the user selection display flow when inserting a PASS Digital Volume into a R/P system. Once a user selection is made, the index, default album, or custom album screen is displayed. The user may then choose to display specific assets. If a default or custom album is selected, the user may also choose to play a slide show.

Figure 3. Example user selection display flow in PASS playback component



5.1. Confirm PASS asset file formats

On recognizing the manifest files, the playback component tries to interpret each PASS asset file referred to by the manifests. The playback component may also have the

capability to display any user messages such as “This file is not available for display” for asset files that the playback component can not decode.

See LDS section 4 for additional information on file formats for PASS assets.

5.2. Initial user selection display

The playback component utilizes the index manifest file and displays information for default and/or custom albums located in the PASS Digital Volume. The information displayed may include metadata or icons associated with the items being shown.

The playback component may display the following items for default and custom albums inserted PASS digital volume on the initial user selection display.

Table 1. Items shown on initial user selection display

Item on initial user selection display	XML tag name	Manifest location	Display Capability
Title of the album	dc:title	Index	Mandatory
Thumbnail derivative	mpv:Rendition	Index	Optional

When the RDS format is utilized, the R/P system may present thumbnail derivative files from the SHARED directory.

5.3. Selection display of default and custom albums

The playback component displays all PASS asset files in each default and custom album as a user selection display. The playback component interprets the manifest files associated with default and custom albums and recognizes the <LastURL> element as the reference of a user selection display for each PASS original asset file or its derivative file (such as a screen or thumbnail file).

The playback component interprets asset elements from default and custom album manifests to recognize if rotation is necessary for the asset. The <dig35:ROLL> element contains orientation information for the asset. (See table 7 in the LDS.)

If a manifest contains the <LastURL> element and its value does not reference a retrievable file, the message “No files to display” or equivalent should be displayed by the playback component.

The playback component may display the following items on a user selection display for default and custom albums.

Table 2. Items on album selection display for default and custom albums

Items on album selection display	XML Element	Location	Display Capability
Title of default album and custom album	dc:title	Index manifest	Mandatory
PASS medium ID	pass:mediumID	Index manifest]	Optional
Title of each PASS asset file	dc:title	Default album manifest Custom album manifest	Optional
Image ID	pass:assetlistID pass:assetID	Default album manifest Custom album manifest	Optionally display as a generated ID using the last three digits (xxx) of pass:assetlistID and last four digits (YYYY) of pass:assetID (ex:xxx-YYYY)
The date of each asset	dc:date	Default album manifest Custom album manifest	Optional

The following actions are undefined:

- Order of search precedence of asset files among original, screen, and thumbnail files
- Method to display background color and fit

The following examples serve to illustrate the R/P functions used for displaying selections of default and custom albums.

Function on screen

Back to album selection display

Display selected PASS asset file individually

Start playing slide show

Print ordering

Function Detail

Allow user to go back to album selection display.

Allow users to select a PASS asset file and display a selected PASS asset file. Refer to section 5.4.

Allow users to go to play slide show function. Refer to section 5.5.

Allow users to go to print image selection function to present selected PASS asset files. Refer to section 6.

5.4. Display PASS asset files individually

The playback component may display selected PASS asset files individually in a serial manner. Selecting any PASS asset file on the user selection display for default albums and custom albums allows the user to enter individual display mode.

The playback component interprets the default and custom album manifest files to recognize the <LastURL> for each PASS original asset file or its derivative file such as screen or thumbnail file.

The playback component recognizes the <LastURL> for each asset in each default or custom manifest as the reference for a user selection display element.

The playback component interprets asset elements from default and custom album manifests to recognize if rotation is necessary for the asset. The <dig35:ROLL> element contains orientation information for the asset. (See table 7 in the LDS.)

If a manifest contains the <LastURL> element and its value does not reference a retrievable file, the message “No files to display” or equivalent should be displayed by the playback component.

The playback component may display asset metadata from the manifest file as well as the asset. Asset metadata is defined in the LDS.

The following actions are undefined:

- Order of search precedence of derivative files among original asset files, screen and thumbnail files;
- Displaying the background color and fit in selection mode.

The following examples serve to illustrate the R/P functions used for displaying individual assets.

Function on individual asset display	Function Detail
Return to user selection display	Allow users to go back to the user selection display.
Play movie or audio in still with audio	Active only when movie or still with audio asset is selected. Allow users to play movie or audio in still with audio when not playing.
Stop movie or audio in still with audio	Active when movie or still with audio asset is selected. Allow users to stop movie or audio in still with audio when playing.

5.5. Display the PASS asset files from each album as a slide show

The playback component interprets default and custom album manifest files to play a slide show for asset files according to presentation information such as playing time, transition effects, background music, and so on.

The following capabilities are required to present albums as a slide show.

A) Interpret control metadata

The playback component interprets mpvpCtrl metadata in default and custom album manifest files.

The playback component interprets album elements from default and custom album manifests, referring only to <mpvpCtrl:ShowRotated> (see Table 11 of LDS) to correctly play the slide show with rotation as necessary. The playback component should, in the case of playing a slideshow, ignore the <dig35:ROLL> element.

Specific behavior for playback of a slide show when there is no entry for the mpvpCtrl name space elements in the default and custom album manifests is undefined.

When there is no <mpvpCtrl:Dur> for video asset or still with audio asset, the R/P may play the video or still with audio asset until playing is complete.

When there is no <mpvpCtrl:Dur> for a still asset, the R/P may play the still asset for the same duration as any slide interval.

B) Recommended rules for playback

The interpretation of the control metadata allows some flexibility using the following playback rules.

- *Playback priority*

Playback component gives priority for playback foreground than background

EX 1) When asset files for both foreground and background is still, playback component overlaps foreground display on background display.

EX 2) When asset files for both foreground and background is audio, playback component plays only those audio asset files in foreground.

EX 3) When asset files for both foreground and background is video, playback component plays only those video asset files in foreground.

- *Playback time*

When total playback time for foreground is not equal to total playback time for background, playback component gives priority for total playback time to foreground.

EX 4) When asset files for background is audio, playback component stops playing audio when playback of foreground asset files is completed.

The playback component may display the following items on the play slide show selection display for default and custom albums.

Table 3. Items on play slide show selection display

Items on play slide show selection display	XML Element	Location	Display Capability
Title of each PASS asset file	dc:title	Default album manifest Custom album manifest	Optional
Image ID	pass:assetlistID pass:assetID	Default album manifest Custom album manifest	Optionally display as a generated ID using the last three digits (xxx) of pass:assetlistID and last four digits (YYYY) of pass:assetID (ex:xxx-YYYY)
Date of each PASS asset file	dc:date	Default album manifest Custom album manifest	Optional

The following examples illustrate the R/P functions that may be seen during a slide show display.

Function on screen

Return to user selection display
Go to previous PASS asset file
Play slide show
Pause slide show
Go to next PASS asset file

Function Detail

Allow user to stop playing slide show and return to user selection display
Allow users to go to previous PASS asset file display.
Allow users to play selected slide show when slide show is paused.
Allow users to pause slide show when slide show is playing.
Allow users to go to next PASS asset file display

6.0. Functional requirements of print image selection component

6.1. Display PASS asset files from an album in PASS Digital Volume

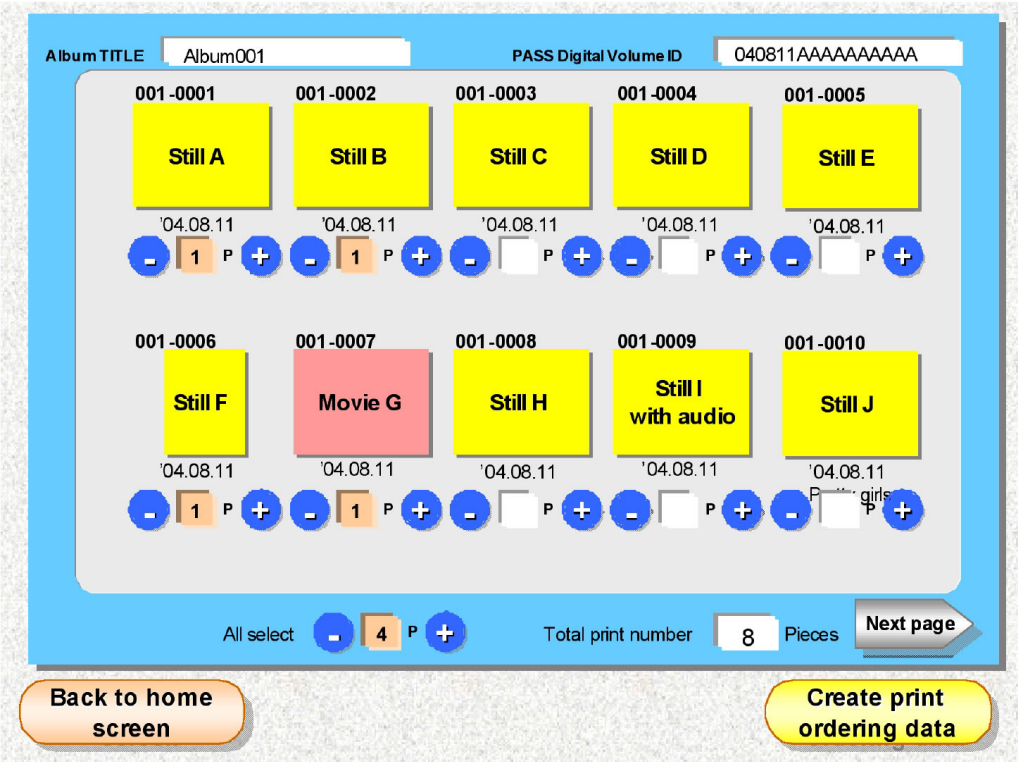
The optional print image selection component must have the same functions as the R/P playback component (see section 5). This allows the component to display PASS asset files from each album in the PASS Digital Volume as a user selection display with the specific purpose of selecting files to print.

The print image selection component, if implemented, must also have the functionality described in 5.4 to display selected PASS asset files individually.

6.2. Select PASS asset files to print and input print number

The print image selection component manages the functions to select PASS asset files for print and input print number for selected still PASS asset files.

Figure 4. Example display when selecting asset files to print



Appendix A. Example screen layouts

The following examples adhere to PASS Digital Volume requirements for R/P systems and are presented for general reference.

Figure A.1. Example of initial user selection display

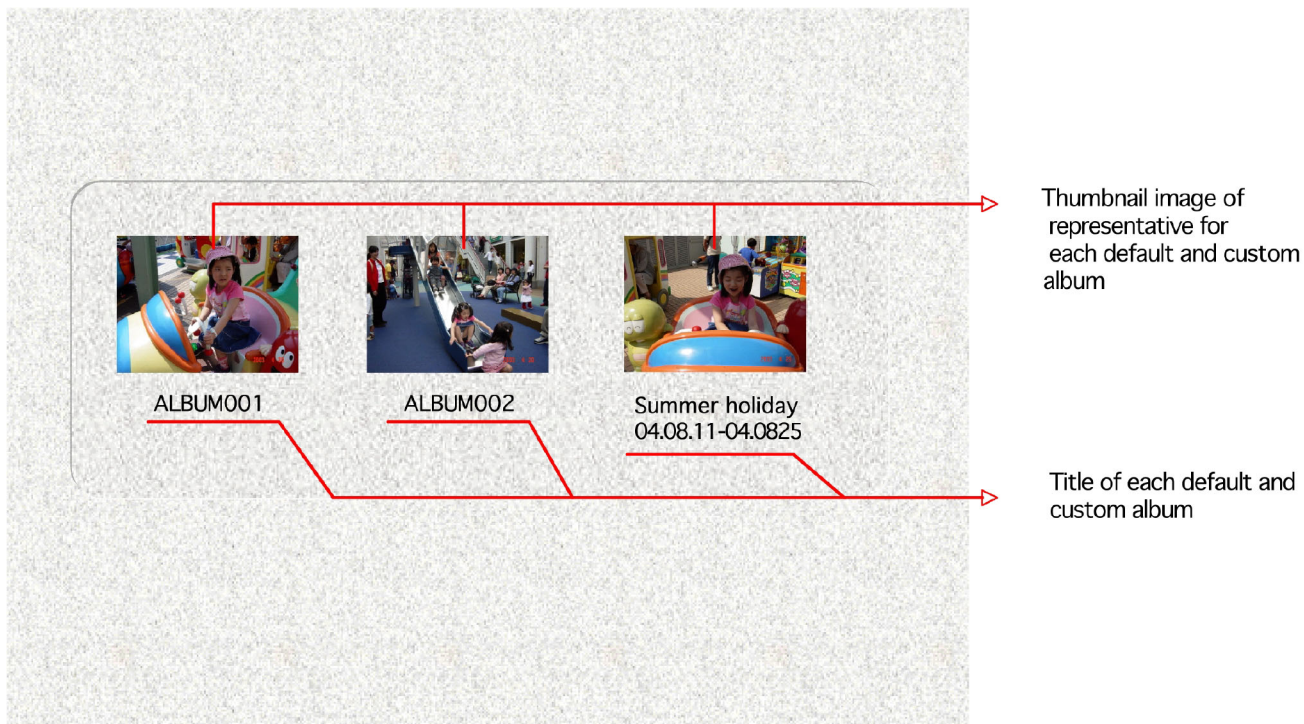
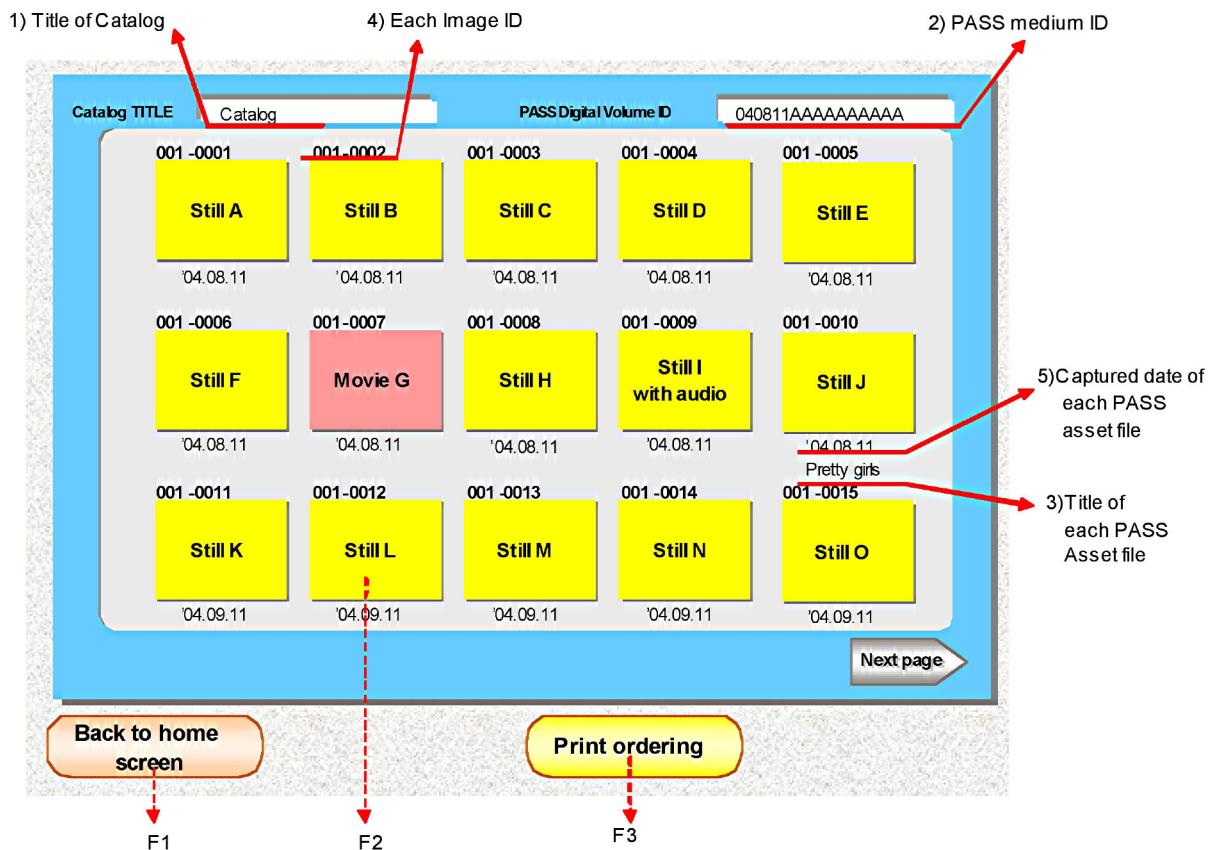
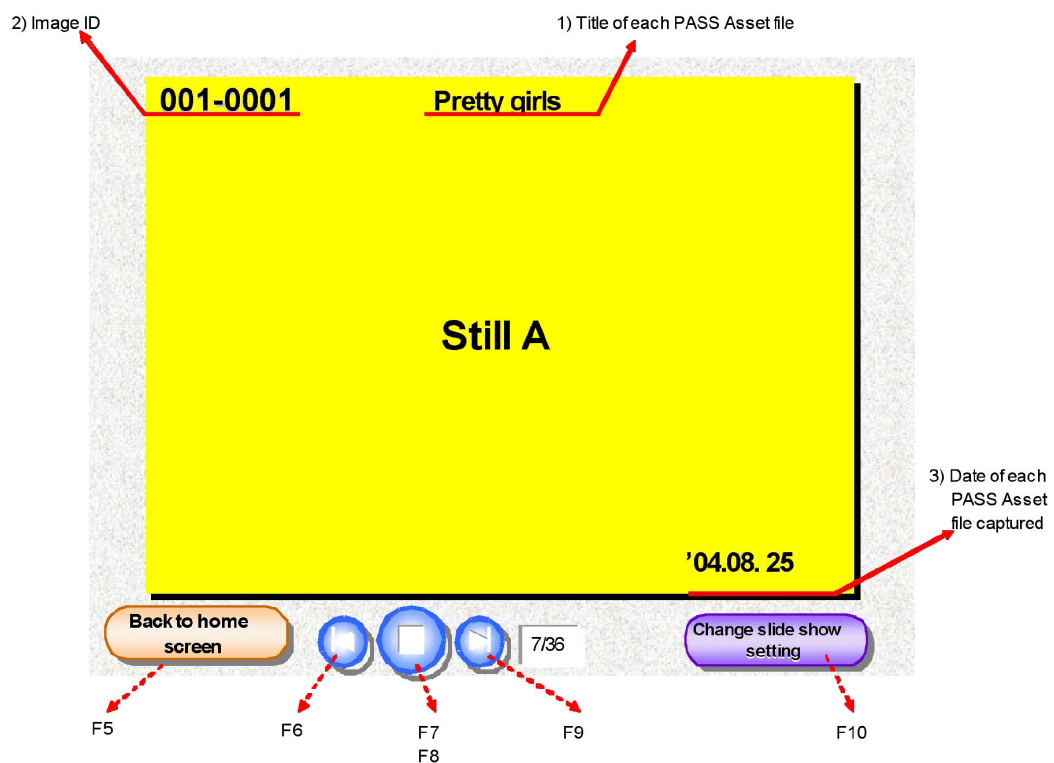


Figure A.2. Example of user selection display for default custom albums



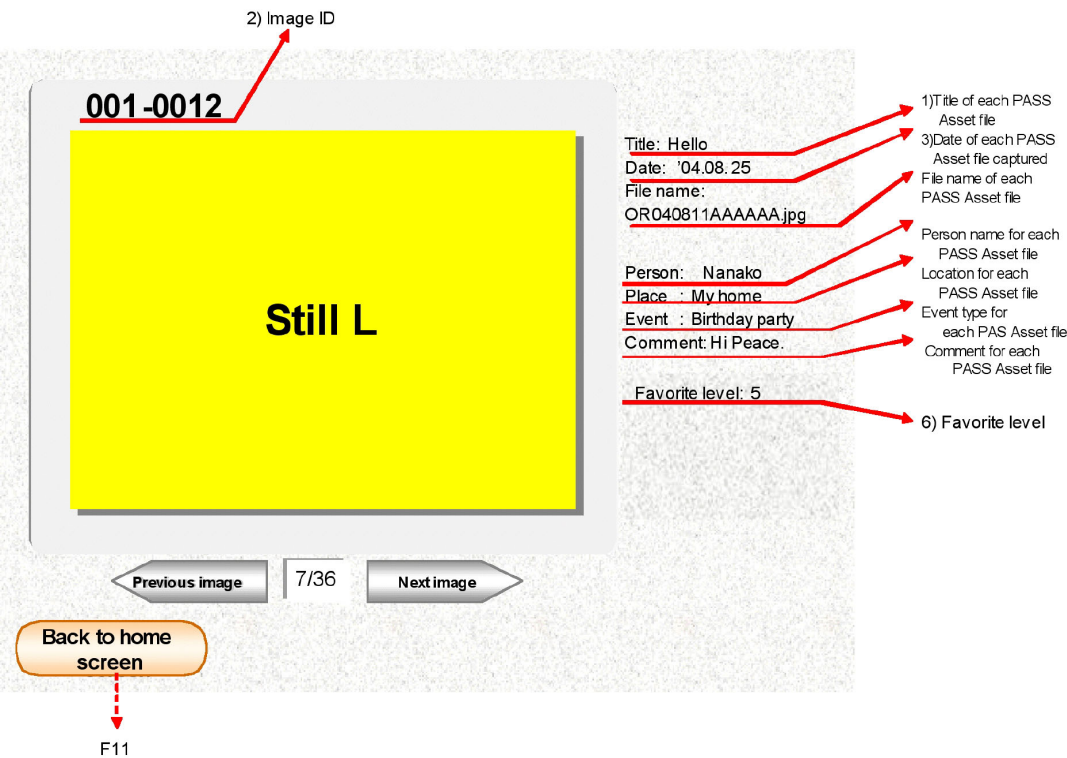
Following is an example for slide show play selection display for default and custom albums.

Figure A.3. Example of slide show play screen



The following is an example of asset display for an individual still asset.

Figure A.4. Example of still asset display screen



The following example shows an asset display for a still asset requiring rotation to display. When displayed, the playback component recognizes the <dig35:ROLL> element in the PASS manifest file and displays the asset correctly. See Table 7 in the LDS.

Figure A.5. Example still asset requiring rotation display screen

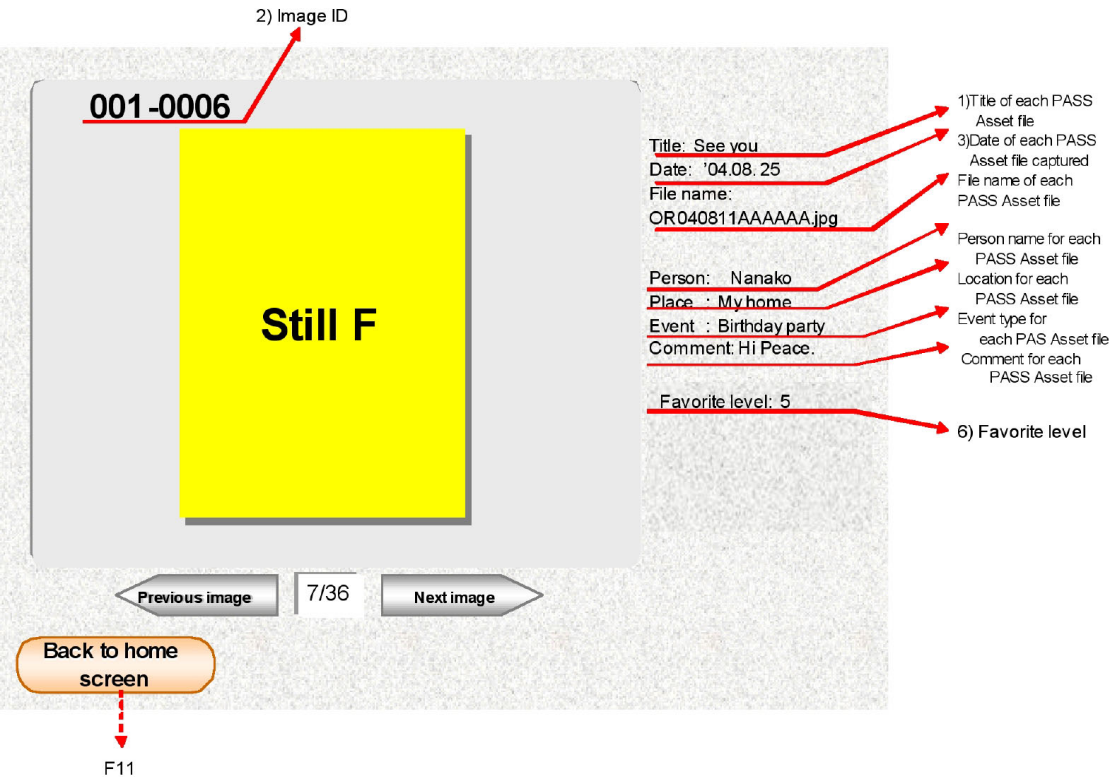
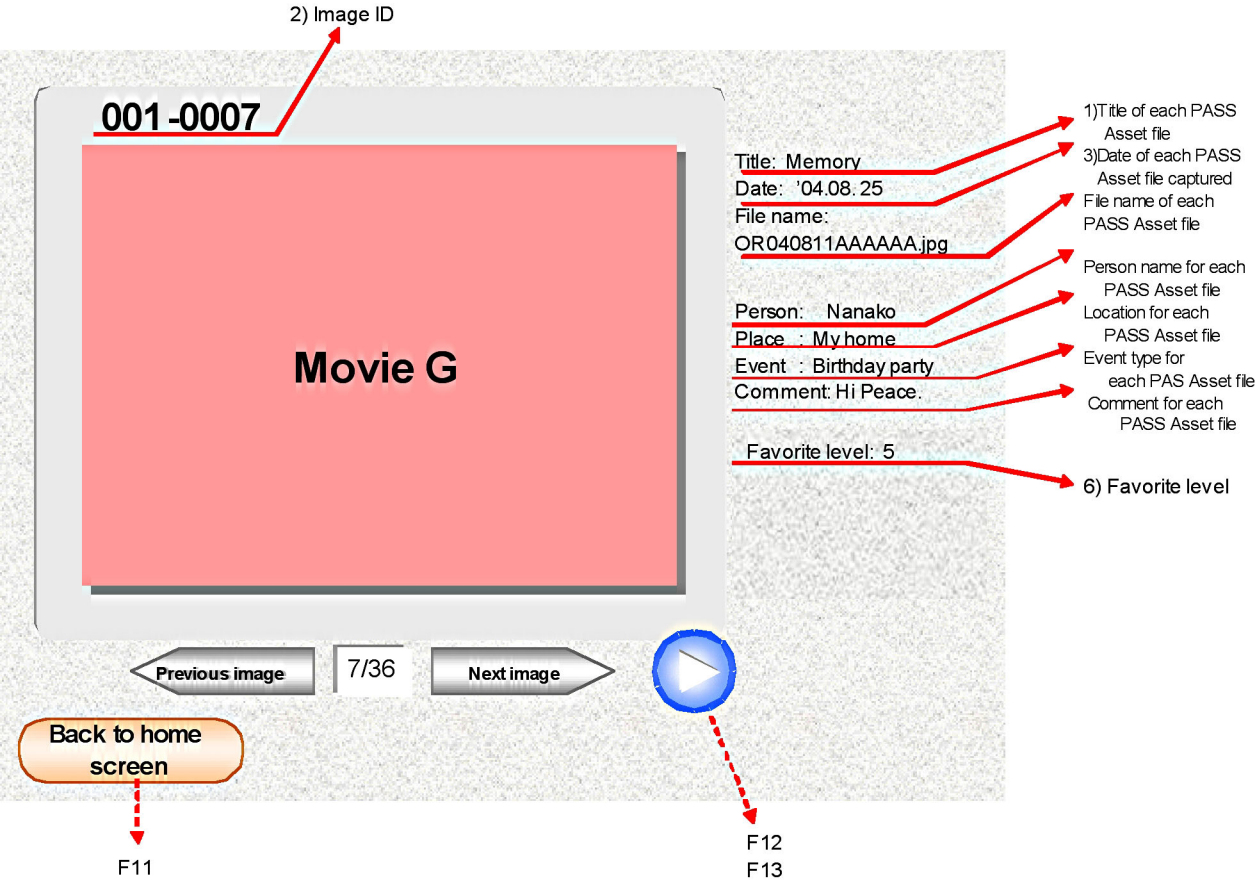


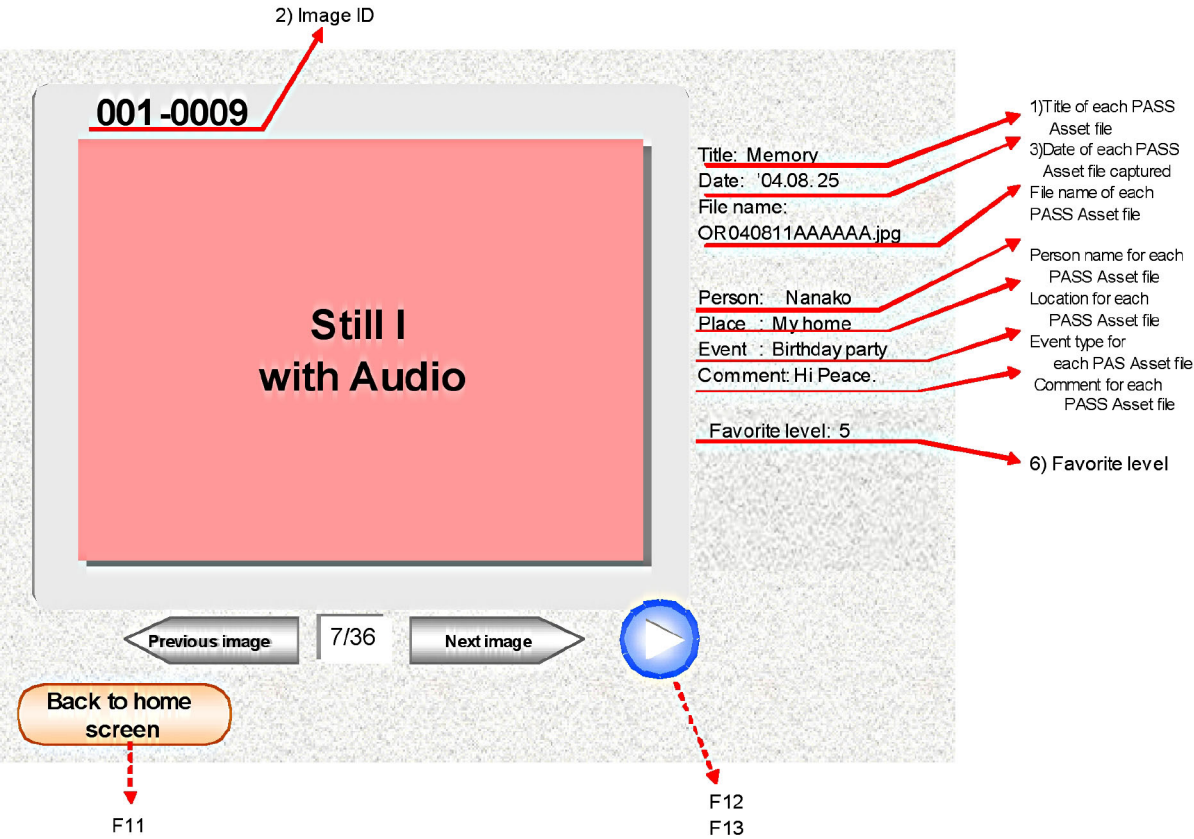
Figure.A.6. shows an example of displaying a video asset. When a PASS asset file is a movie, a representative image from the motion file may be shown on the user selection display. Alternatively, an icon or text identifying the asset as video may be used.

Figure A.6. Example of video asset display screen



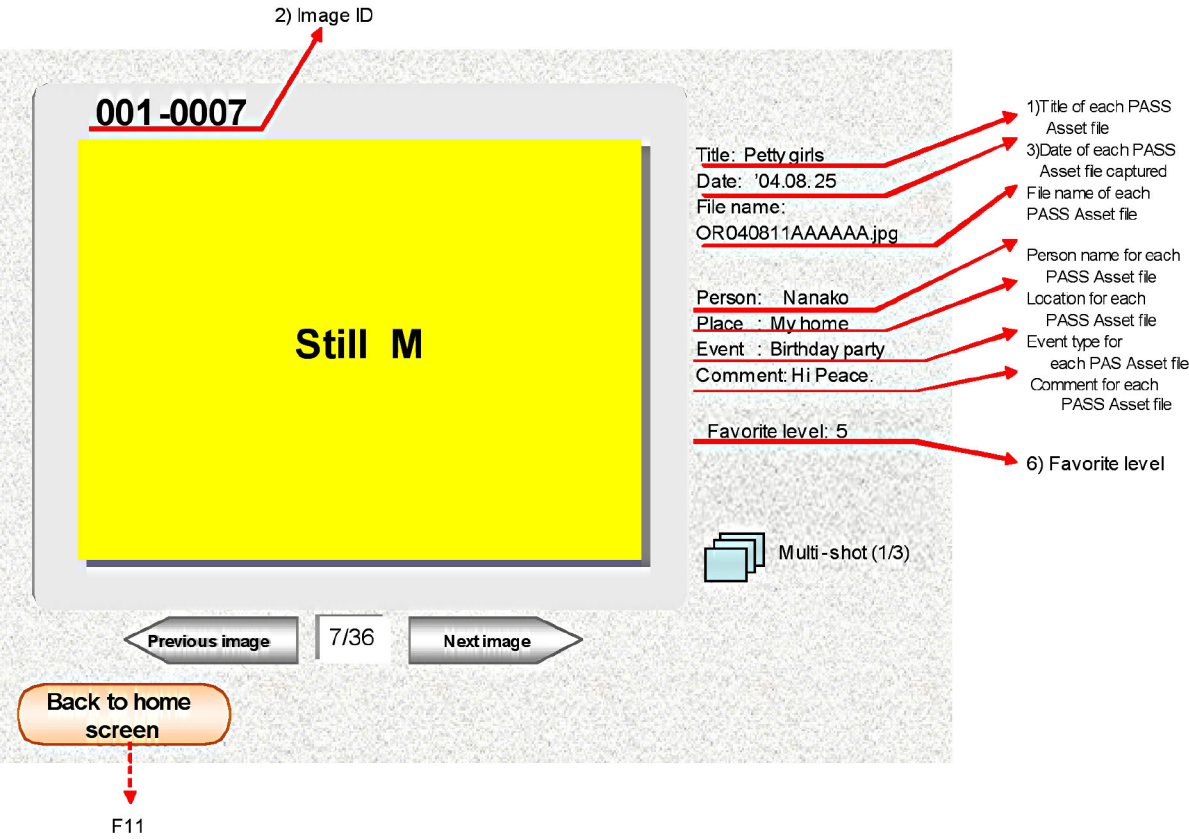
The following is an example of displaying a still with audio. Alternatively, an icon or text identifying the asset as still with audio may be used.

Figure A.7. Example of still with audio display screen



The following is an example showing a still multishot display screen. Alternatively, an icon or text identifying the still multishot may be displayed.

Figure A.8. Example of still multishot display screen



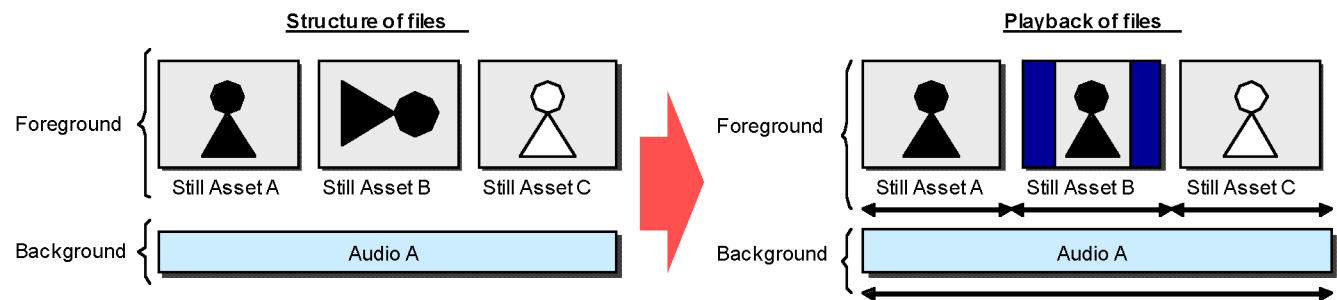
Appendix B. Playback scenarios

In order to explain in more detail the use of playback rules and interpretation of the mpvpCtrl name space elements, variations of a playback scenario as slide show are shown below.

< PLAYBACK SCENARIO 1>

- Foreground files: Still (still asset A, B, C); still asset B requires rotating when displayed.
- Background file: Audio (Audio A)

Figure B.1. Playback of asset files in scenario 1

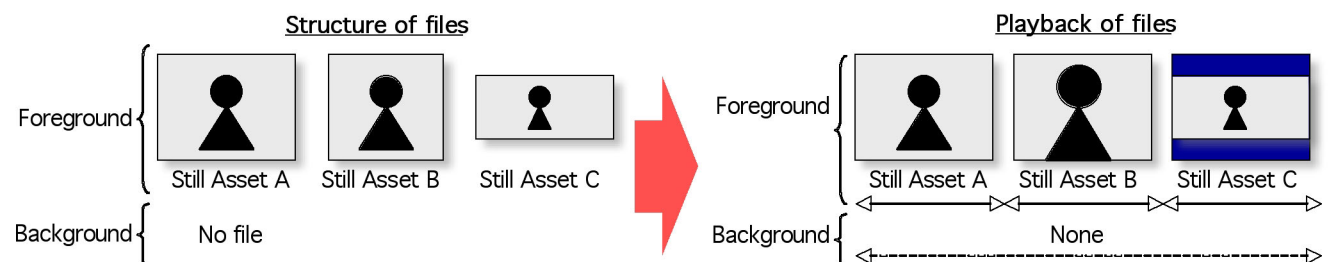


The R/P playback component recognizes the elements for Background [color], Fit, and ShowRotated elements in default and custom album manifest files and displays still asset B correctly according such elements.

< PLAYBACK SCENARIO 2>

- Foreground files: Still (still asset A, B, C); aspect ratio of still asset B and C is different from that of display region.
- Background file: No file

Figure B.2. Playback of asset files in scenario 2



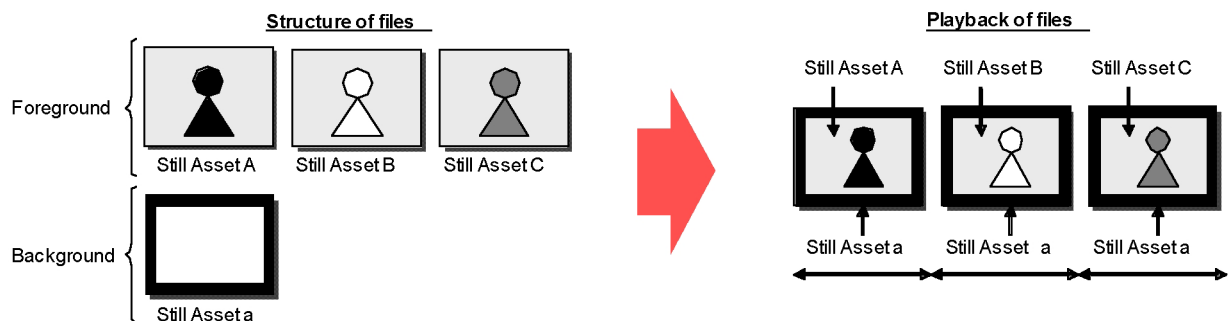
The R/P playback component recognizes the elements for Background [color] and Fit elements in the default and custom album manifest files and correctly displays still asset B and C according to the manifests elements.

< PLAYBACK SCENARIO 3>

Foreground files: Still (still asset A, B, C)

Background files: Still (still asset a) used as a frame template for still assets A, B, and C.

Figure B.3. Playback of asset files in scenario 3



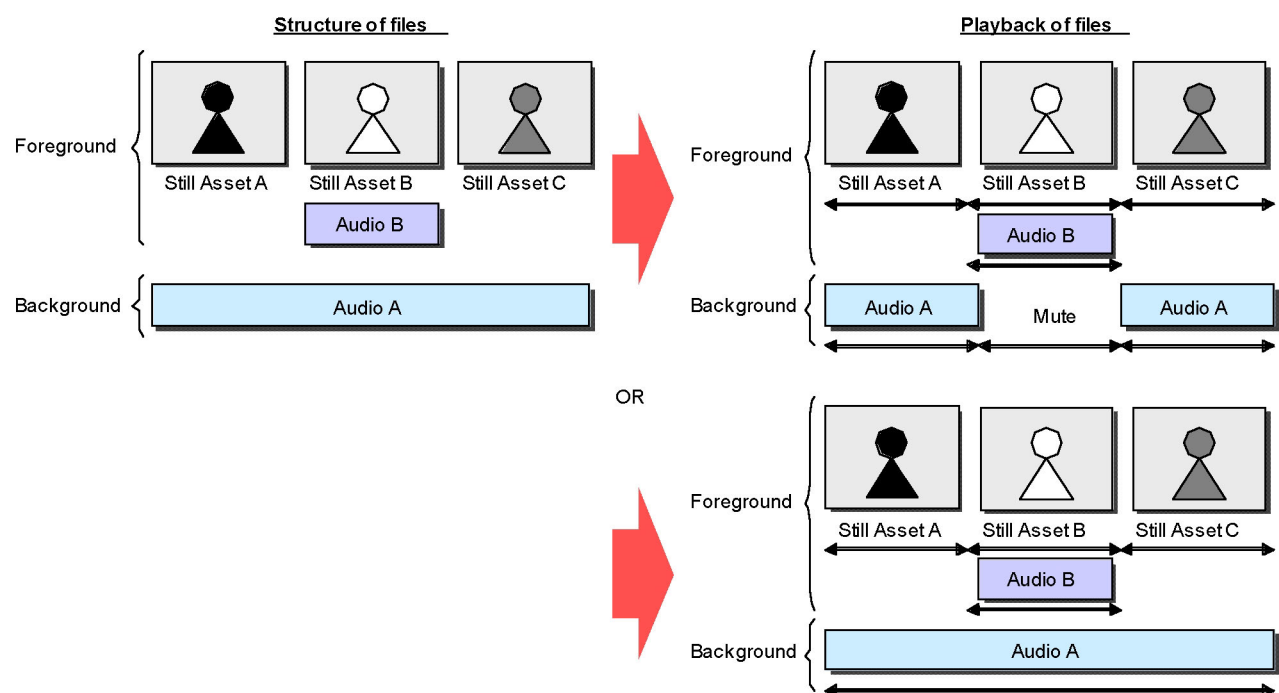
The R/P playback component recognizes Margin element in default and custom album manifest files and correctly displays still asset A, B, and C with still asset a as a frame.

< PLAYBACK SCENARIO 4>

Foreground files: Still (still asset A, C), still with audio (still asset B and audio B)

Background file: Audio (audio A)

Figure B.4. Playback of asset files in scenario 4

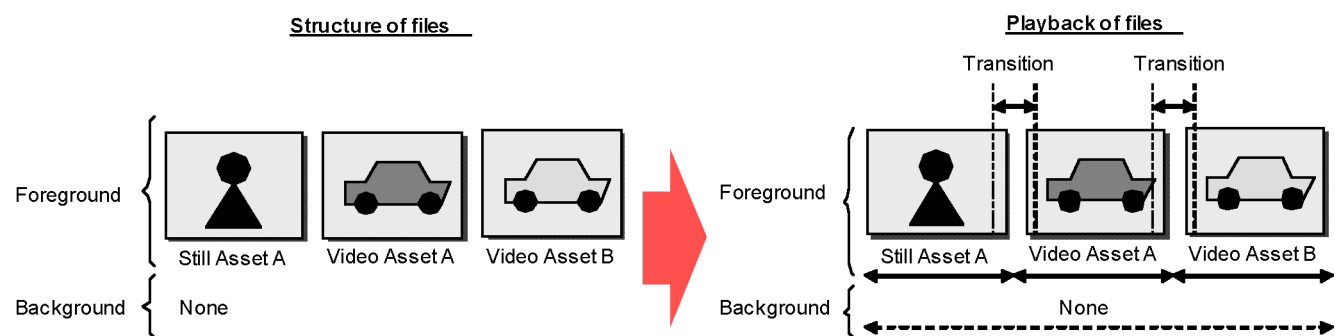


The R/P playback component plays only audio B as foreground and mutes audio A in background while audio B is playing in foreground. An alternative, not recommended, is to play both audio B as foreground and audio A as background simultaneously.

< **PLAYBACK SCENARIO 5** >

- Foreground files: Still (still asset A), video (video asset B, C); elements for mpvp:Trans are described in default and custom album manifest files
- Background files: None

Figure B.5. Playback of asset files in scenario 5



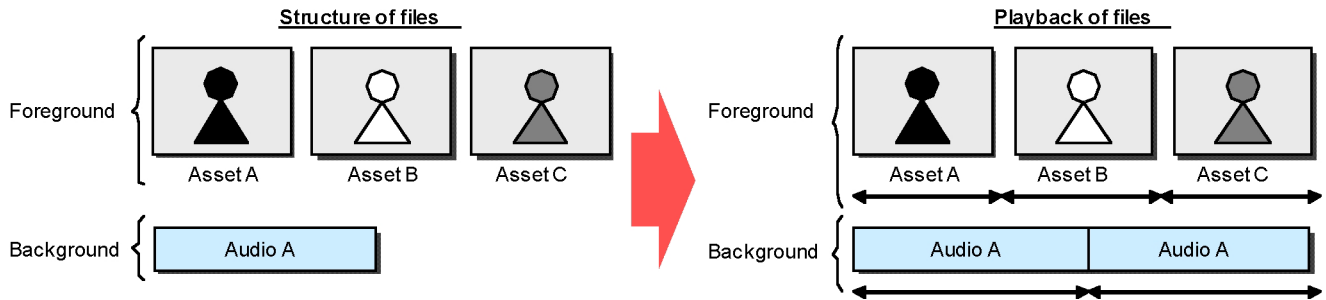
The R/P playback component recognizes the mpvpTrans name space element in default and custom album manifest files and correctly displays still asset A and video assets B and C.

< PLAYBACK SCENARIO 6>

Foreground files: Asset A, B, C

Background files: Audio (audio A); the length of playing time for audio A is shorter than the length of total playing time for asset A, B, C

Figure B.6. Playback of asset files in scenario 6



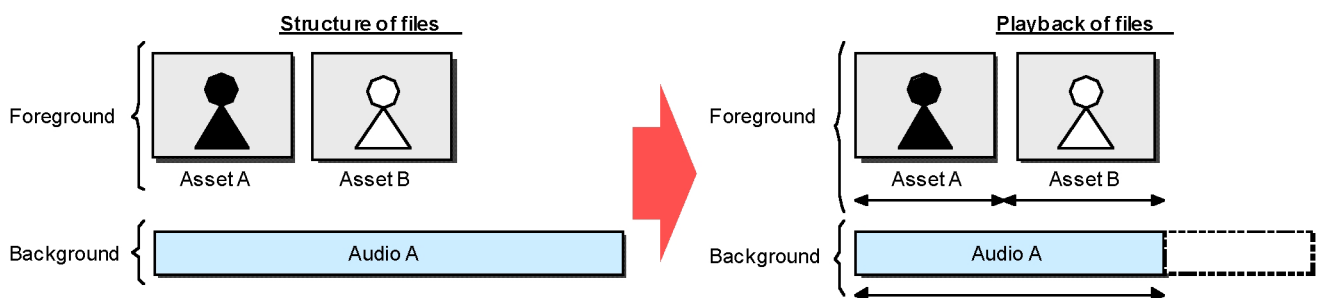
The R/P playback component recognizes the length of total playing time for asset A, B, C as foreground and the length of playing time for audio A as background. When the length of playing time for audio A is shorter than the length of total playing time for asset A, B, C, the playback component may repeat audio A in background until playing is complete.

< PLAYBACK SCENARIO 7>

- Foreground files: Asset A, B

- Background files: Audio (audio A); the length of total playing time for asset A and B is shorter than the length of playing time for audio A.

Figure B.7. Playback of asset files in scenario 7



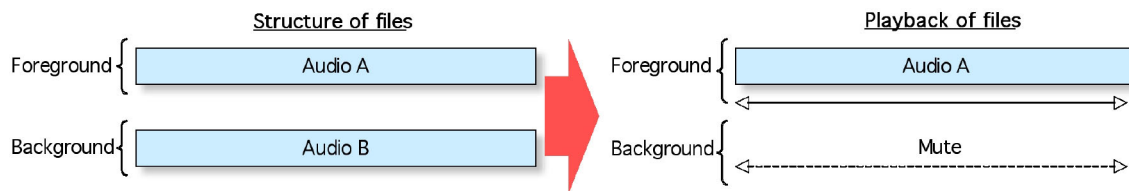
The R/P playback component recognizes the length of total playing time for asset A and B as foreground and the length of playing time for audio A as background. When the length of total playing time for asset A and B is shorter than the length of playing time for audio A, the playback component may stop playing audio A when asset A and B are completed.

< PLAYBACK SCENARIO 8>

Foreground files: Audio A

Background files: Audio B

Figure B.8. Playback of asset files in scenario 8



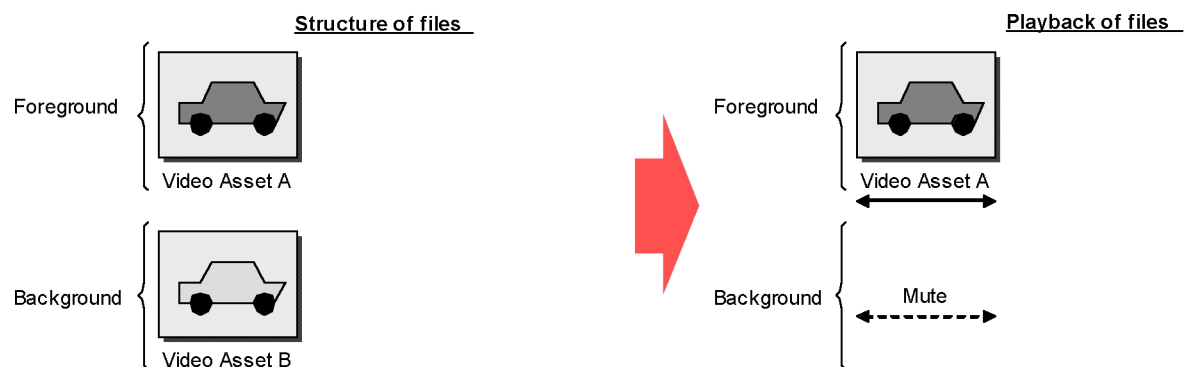
When both foreground and background files are audio, the R/P playback component plays audio A in foreground and mutes audio B in background.

< PLAYBACK SCENARIO 9>

Foreground files: Video A

Background files: Video B

Figure B.9. Playback of asset files in scenario 9



When both the foreground and background files are video, the R/P playback component plays video A in the foreground and mutes video B in background.