

DoStudio Authoring Edition – Core 3D

Version 2.3

NetBlender Press

DoStudio Authoring Edition 2.3
By The NetBlender Press Team

Copyright © 2011 NetBlender Inc. All rights reserved.

Published by NetBlender Inc, 113 North Henry Street, Alexandria Virginia, 22314 United States

Printing History

September 2009	DSA 1.8 Version
April 2010	DSA 1.9 Version
August 2010	DSA 2.0 Version
September 2010	DSA 2.1 Version
January 2011	DSA 2.3 Version

DoStudio, and DSA are trademarks of NetBlender Inc. NetBlender is a registered trademark of NetBlender Inc.

While every precaution has been taken in the preparation of this book, the publisher and author assume no responsibility for errors or omissions, or for the damages resulting from the use of the information contained herein.

0-596-10065-5
[c]

DoStudio Authoring Edition – Core 3D

Version 2.3

Contents

Introduction	1
Chapter 1: Getting Started	2
Create a New Project.....	2
The Core 3D Workspace	2
Summary of the Playlist Elements.....	3
Chapter 2: Setting up your 3D Segments and Playlists	4
Section 1: The 3D Segment	4
Adding a 3D Segment.....	4
3D Segment Properties	5
Primary Video for 3D	5
Adding Audio and Subtitles to a 3D segment.....	6
Section 2: The 3D Playlist.....	10
Creating Playlists with Drag-and-Drop.....	10
Creating Playlists Directly from Segments	11
The 3D Playlist Properties	12
Adding Chapters to Playlists.....	14
Chapter 3: Setting up a Play-only BD Title	16
Add the BD title	16
Add Playlists to the BD Title	16
BD Title Properties.....	16
Chapter 4: Completing the 3D Disc	18
BD Title Information	18
BD3D Information.....	18
Compiling Your 3D Disc.....	19
Appendix A – Metadata Offset File.....	20
3D Meta Text File *.do3d	20
The .Do3D HEADER	20
The .Do3D Body	21

Introduction

This manual introduces you to NetBlender's Core 3D application, which allows you to easily create auto play BD3D discs.

Core 3D is essentially a limited edition of NetBlender's DoStudio EX. Core 3D uses the same interface elements as DoStudio EX, but does not include menu authoring.

Chapter 1: Getting Started

Create a New Project

To begin, you must create a new project. Press the New Project icon in the tool bar or select File>New. Choose a location where you would like your project files to be stored.

It is advisable that you setup a folder called DSA Projects and create a folder for each Blu-ray disc project within the DSA Projects folder. A sample directory structure would look like this:

- My Documents
 - DSA Projects
 - My BD Project (this is called the root folder for the project)
 - Audio/Video
 - Subtitles
 - myBDproject.dsap
 - myBDproject.content
 - myBDproject.BD

When you save your project for the first time, DSA will create a folder in the project's root folder called *projectname.content*. When you compile your project DSA will create a folder called *projectname.BD* that contains the compiled disc image.

Your audio, video and subtitle assets can reside in a different folder.

The Core 3D Workspace

DoStudio Core 3D uses the Playlist tree features of DoStudio EX but does not allow you author menus or complex Playlist interactivity. The interface is similar to DoStudio Authoring Edition, but includes only three windows in the workspace: The Playlist Tree, the Control Panel and the Validation Tab.

The Playlist tree contains the content of your Blu-ray 3D disc. The elements that comprise the Playlist are summarized in the next section.

The Control Panel displays the editable parameters for any item you have selected in the Playlist tree. The parameters are always relevant to the selected item. When you select a Playlist or a BD title in the Playlist tree a drag-and-drop timeline is displayed in the Control Panel.

The Validation tab displays log information when you compile your Blu-ray disc.

Summary of the Playlist Elements

Audio/Video Segments

Segments are your actual video elementary streams. If you have audio and subtitles, they are associated with the video streams in the segment. You add your elementary streams as segments in your project and then you add the Audio/Video Segments to Playlists. You can only add one 3D segment to each playlist.

Base View

The base view is the left eye's MVC file. This MVC file is a full resolution AVC file with additional information that can be used by a Blu-ray 3D player.

Dependent View

The dependent view is the right eye's MVC file. This MVC file does not work without the base view file.

Playlists

Playlists define how your video will play on your Blu-ray Disc, and how your video will interact with your menus (Core 3D does not allow you to add menus but DoStudio EX does). In Core 3D, you can add up to 999 Playlists to your project.

Blu-ray Disc Titles

Blu-ray Disc Titles are the parent element for your Playlists. You will add one BD Title to your disc and then drag your playlists into the BD Title.

Chapter 2: Setting up your 3D Segments and Playlists

This chapter will describe the steps to setup your 3D Segments and create a 3D playlist.

Section 1: The 3D Segment

Adding a 3D Segment

By default your Blu-ray disc project contains one 2D Segment. When creating a 3D disc, you can delete this segment by right mouse clicking it and selecting “Remove Segment” from the context menu.

To add a new 3D Segment, right mouse click on the Audio Video Segments and select “Add 3D Segment”. A 3D segment can have audio and subtitles added to it.

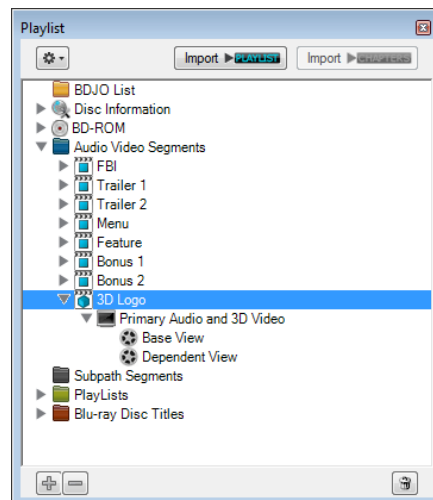


Figure 1 - A 3D Segment Tree Node Expanded

3D Segment Properties

When you select a 3D Segment in the Playlist tree its properties are displayed in the Control Panel. You may rename the segment by typing a new name in the “Name Field.”

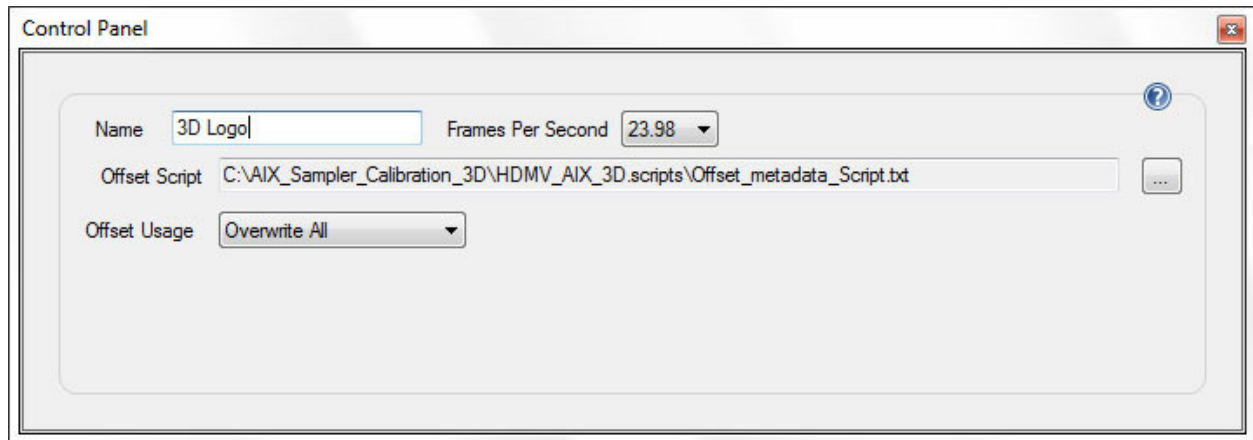


Figure 2 - Editing a 3D Segment's Settings

You assign the frame rate of the video in your segment using the “Frames Per Second” combo box. The frame rate options for Blu-ray 3D are: 23.98, 50, 59.94. Each Segment in a Blu-ray disc can have a different frame rate.

3D segments also contain a path to an optional offset script. This script can be used to define the z-depth of the menu when they appear on screen. This offset script can define a constant z-depth for the entire length of the segment, or it can change the z-depth of the menu over the duration of the segment.

The Offset Usage combo box contains the following options:

1. Keep Original – if your MVC file contains offset data it will take priority over the offset data in the Offset Script
2. Overwrite All – the offset data in the Offset Script will take priority over any offset data embedded in the MVC file
3. Update PTS Only – Updates the PTS values with values from the script file but maintains the offset date in the MVC stream

Primary Video for 3D

3D segments require 2 video files. When you add a 3D segment you will see two empty video nodes in the tree called “Base View” and “Dependent View.”

Blu-ray 3D only accepts one video codec called Multiview Video codec, or MVC (.mvc). In layman’s terms, the MVC format includes a full-frame 2D AVC stream, called the Base View, and

a secondary offset stream called the Dependent View. MVC streams are backward compatible with H.264/AVC, which allows standard 2D Blu-ray players and software to decode stereoscopic video streams. They play the Base View and simply ignore the additional information contained in the Dependent View.

The MVC format is highly efficient and the Dependent View only adds about 50% extra file size to the overall stream.

Adding Audio and Subtitles to a 3D segment

Audio Track

To add an audio track to a Segment, right click the Primary Audio and 3D Video element in the Playlist tree to display the context menu and select “Add Audio” and choose the file for the track from the dialogue box. To update or change a file after it has been added, click the Audio Track element in the tree and select an audio file for the track in the Control Panel using the ellipses button. You may add multiple audio tracks to a Title.

Supported Audio Codecs:

- LPCM 2.0, 5.1, 7.1 (.wav)
- Dolby Digital 2.0, 5.1 (.ac3)
- Dolby Digital Plus (.ec3)
- Dolby TrueHD (.ac3 core + .mlp)
- DTS-HD (.dtshd)
- DTS-HD High-Resolution (.dtshd)
- DTS-HD Master Audio (.dtshd)

Adding Dolby TrueHD to your project

Dolby TrueHD consists of a core 5.1 Dolby Digital file (.ac3) plus a lossless 7.1 TrueHD file (.mlp). To add a TrueHD file to your project, select the core .ac3 file first, then add the .mlp file in the second dialogue box that appears. It will look like this:

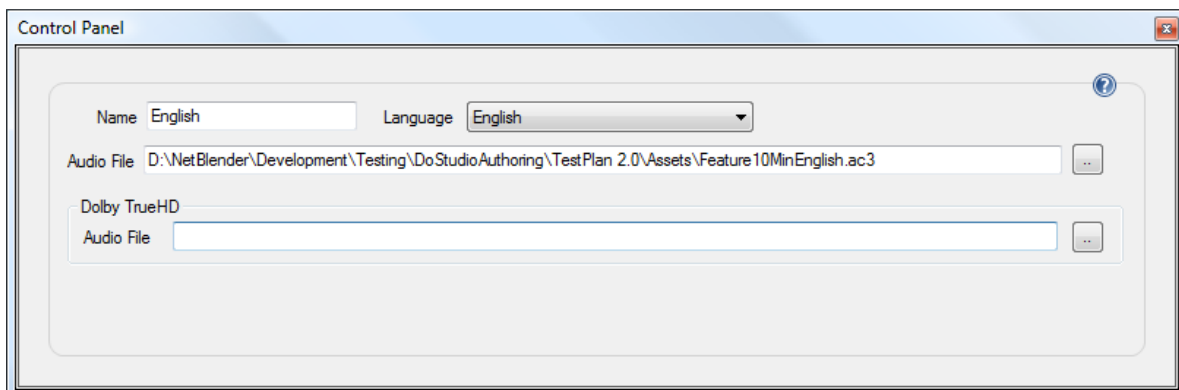


Figure 9.3 - Audio Settings

Adding Multi-channel LPCM files to your project

DoStudio supports multichannel LPCM (.wav) files in 6-channel (5.1 surround) and 8-channel (7.1 surround) configurations.

The channel configurations are as follows:

6-channel configuration (5.1) - the channel assignment is:
(from channel 1 to channel 6)
L, R, C, LS, RS, Lfe

8-channel configuration (7.1) - the channel assignment is
(from channel 1 to channel 8)
L, R, C, LS, Rls (rear left surround), Rrs (rear right surround), RS, Lfe

Using a single Interleaved .wav file

The channels can be interleaved in a single .wav file by your audio editing package. If you have a single, interleaved file, then add the multichannel .wav file to your Primary Audio the same way you would add a stereo .wav file or any other single-file audio source by right-clicking the Primary Audio/Video element and selecting “Add Audio”.

Using individual .wav files

You can also add multichannel LPCM audio by adding individual .wav files. To do this, right-click on the Primary Audio/Video element in your Playlist and select “Add Multi-Channel Audio.”

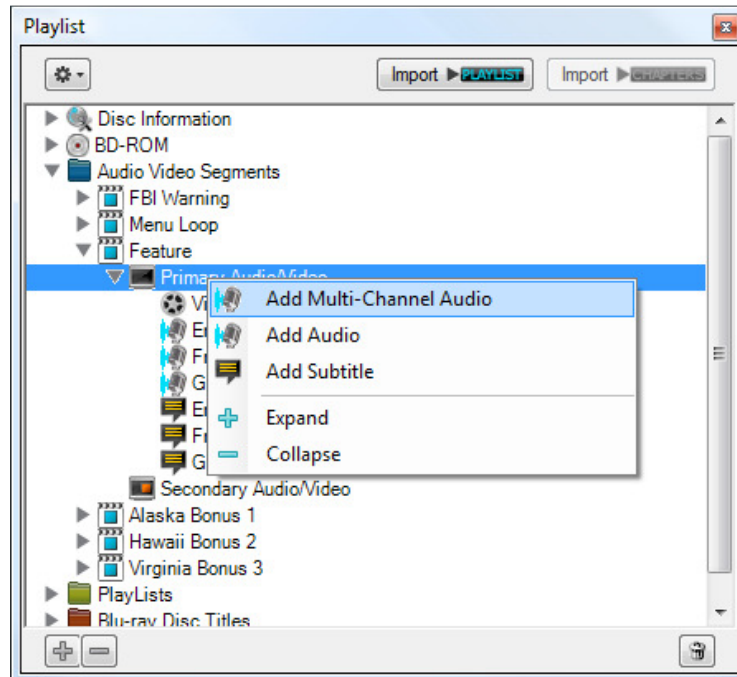


Figure 9.4 - Adding Multi-Channel Audio

A new Audio Track will be added to your Playlist. Select it in the Playlist tree and select each individual .wav file in the fields in the Control Panel.

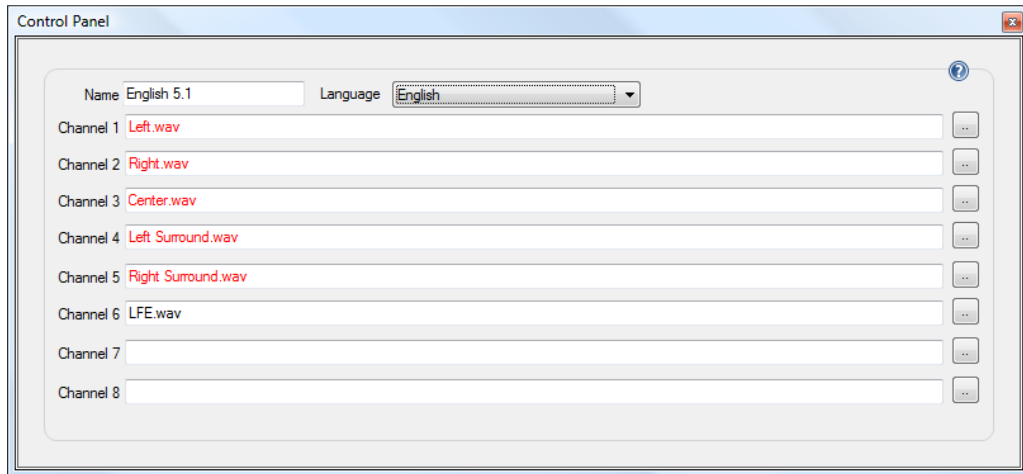


Figure 9.5 - Multi-Channel Settings Control Panel

For a 5.1 multichannel mix, select files for the first 6 channels according to the order described above. It is OK to leave the fields for Channel 7 and Channel 8 blank. For a 7.1 multichannel mix, select files for all 8 channels according to the order described above.

Language Display Setting

You may assign a Language Display setting to the audio track using the Language Combo box. This language setting will be displayed on screen or on the Blu-ray Player's front panel display if the player supports this display option.

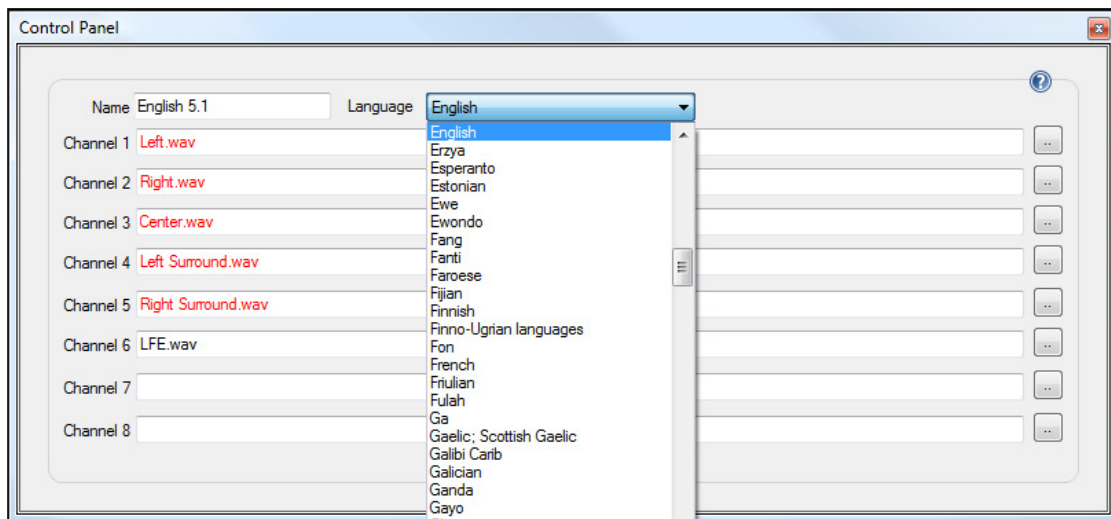


Figure 9.6 - Language Display Settings

Subtitles

DSA uses graphics-based subtitles for Blu-ray. Please refer to the DoStudio Authoring Edition manual for information about creating subtitles.

You add your subtitle tracks directly to the Primary Audio and 3D Video Segment. To add a subtitle track, right click the Primary Audio and 3D Video element in the Playlist tree and select “Add Subtitle” from the context menu.

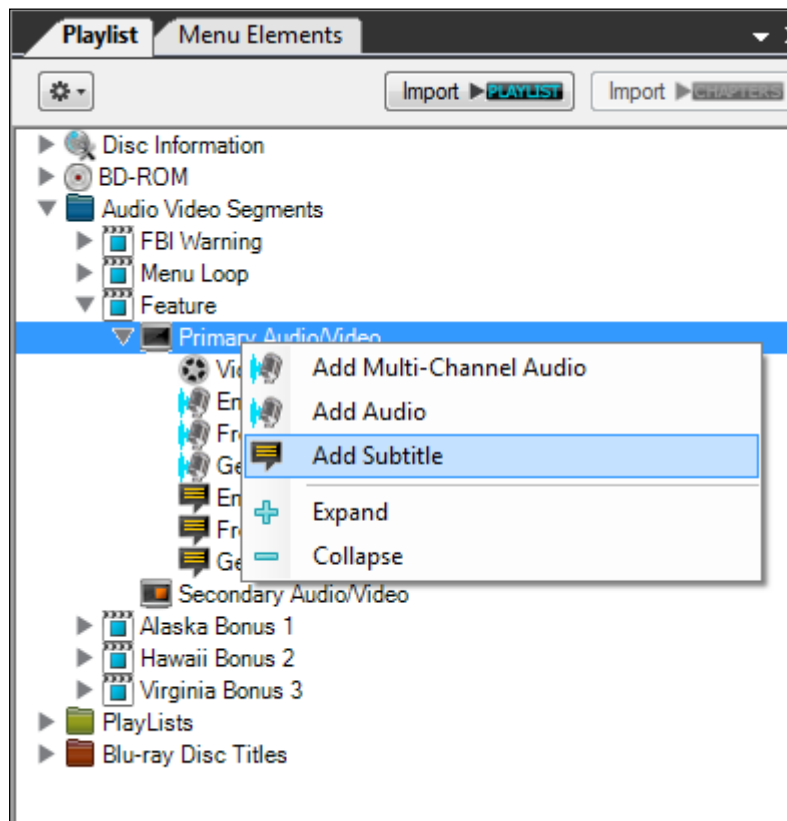


Figure 9.7 - Adding a Subtitle

Click the Subtitle Track element in the tree and select a subtitle file (.dost) for the track in the Control Panel using the ellipses button. You may add multiple subtitle tracks to a Segment.

Section 2: The 3D Playlist

You must add your 3D segments to playlists in order to add them to your BD title. There are two methods for creating Playlists and adding segments.

Creating Playlists with Drag-and-Drop

You can add a playlist and then add a Segment to the Playlist by dragging the Segment onto the Playlist timeline in the control panel. To do this, right-click on the Playlists folder in the tree and select “Add Playlist” from the context menu.

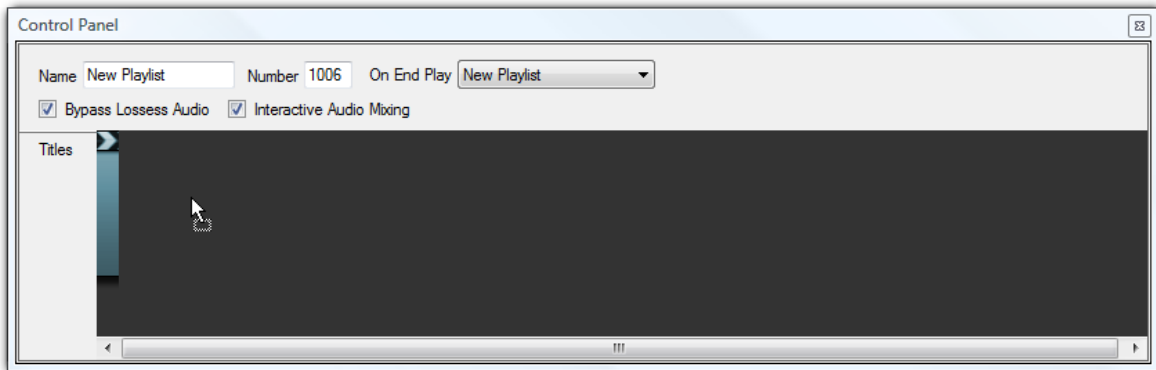


Figure 10.1 – Adding a Segment to a Playlist with Drag-and-Drop

A playlist will appear in the tree. Selecting it will display the Playlist timeline and properties in the Control Panel.

Creating Playlists Directly from Segments

You can right-click on a segment in your tree and create a new playlist that contains that segment by selecting “Create Playlist from Segment”. This will add a new Playlist in the tree and automatically add the Segment to the Playlist timeline.

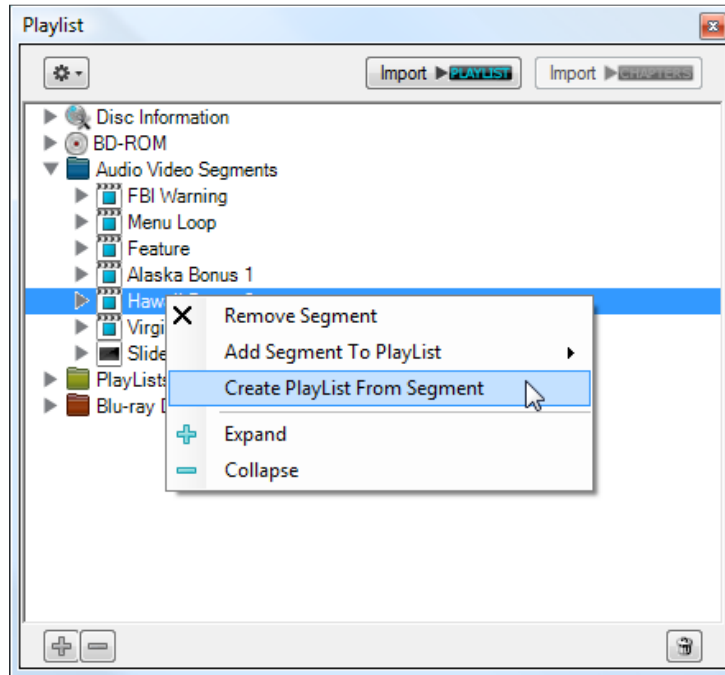
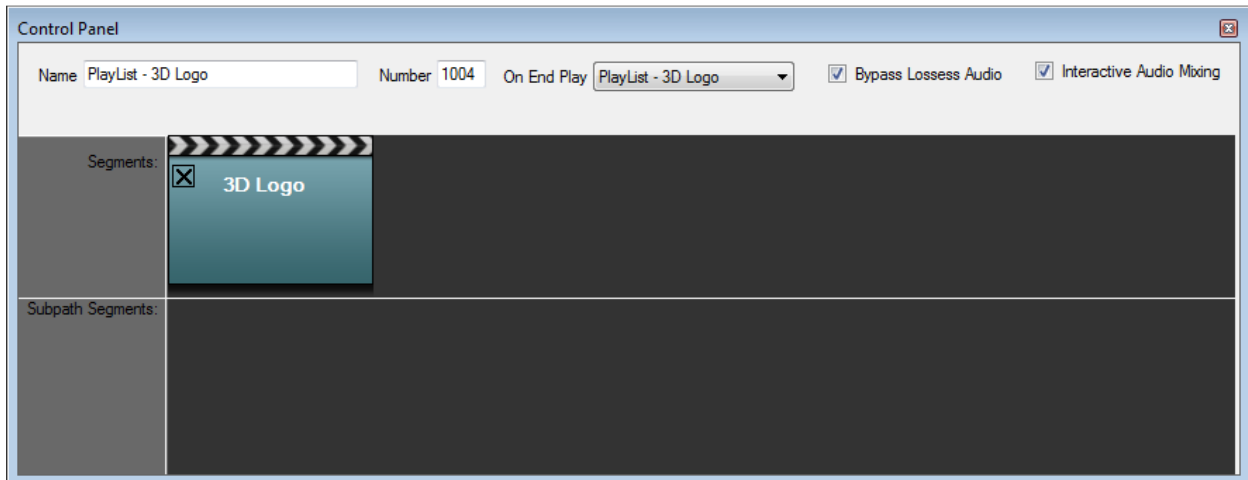


Figure 10.2 – Creating a new Playlist from a Segment

You can only add one 3D Segment per playlist. You can create up to 999 Playlists in your project.

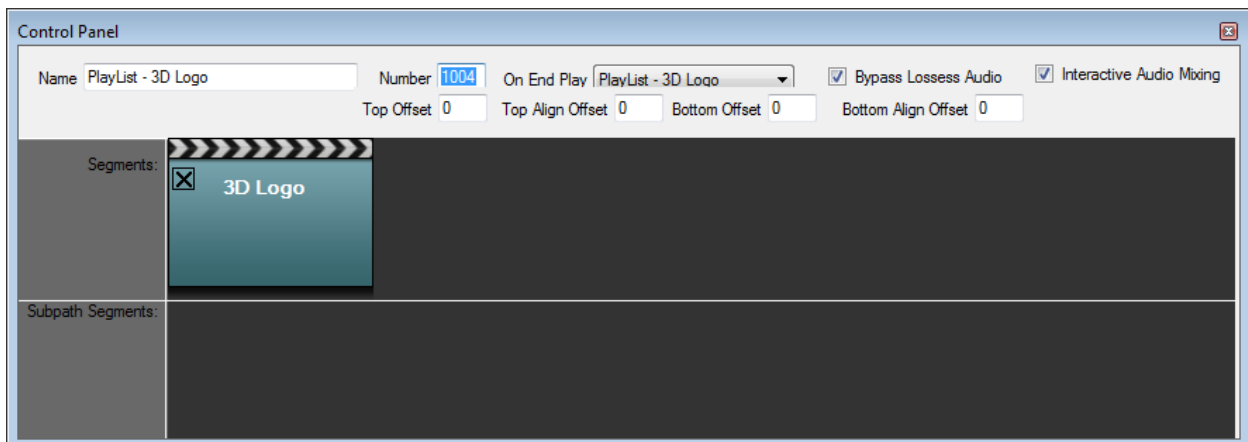
The 3D Playlist Properties

When you have a 3D playlist that does not have subtitles the playlist properties will look like the figure below:



You can rename the playlist if you desire. The Playlist number, On End Play and other properties are not used in Core 3D.

A 3D playlist with subtitles will show you four new properties that are related to your 3D playlist.



3D subtitles can be over the video or they can be place in the upper or lower 3rds. Using the Top Offset or Bottom Offset allows you to position the 3D subtitles. If all of the values are 0 then the subtitles will appear over the screen.

Top Offset: This field is used to derive the *TopOffset*. *TopOffset* is the vertical pixel value of the video window from the top of the frame.

Top Align Offset: This field is used to derive the *AlignOffset* for presentation of the Top Aligned PG textST stream with the subtitle aligned toward the top of the frame. *AlignOffset* is the vertical coordinate of the output video frame where the active video window shall be aligned. The top samples contained in the video window are positioned at the vertical coordinate *AlignOffset* in the output video frame.

Bottom Offset: This field is used to derive the *BottomOffset*. *BottomOffset* is the vertical pixel of the video window from bottom of the frame.

Bottom Align Offset: This field is used to derive the *AlignOffset* for presentation of the Bottom Aligned PG textST stream with the subtitle aligned toward the bottom of the frame. *AlignOffset* is the vertical coordinate of the output video frame where the active video window shall be aligned. The top samples contained in the active video window are positioned at the vertical coordinate *AlignOffset* in the output video frame.

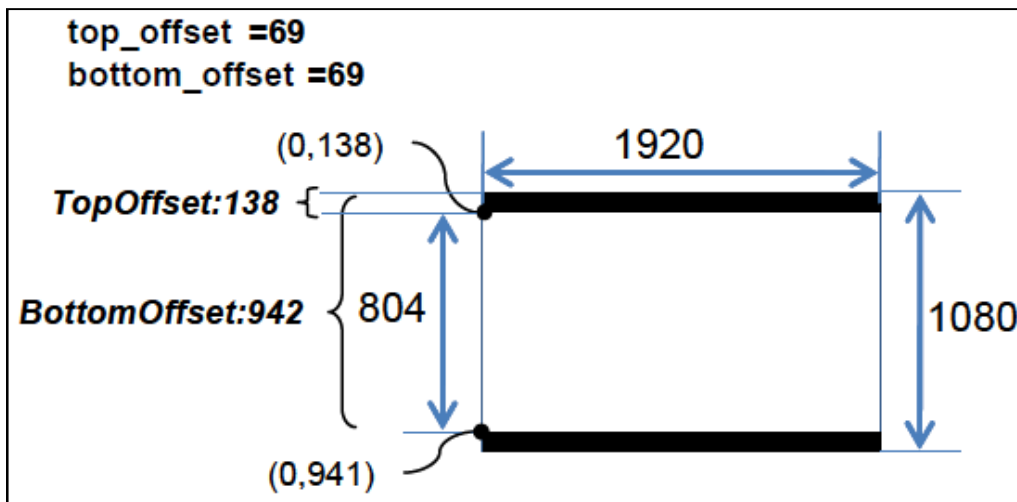


Figure 3 - Example of TopOffset and BottomOffset

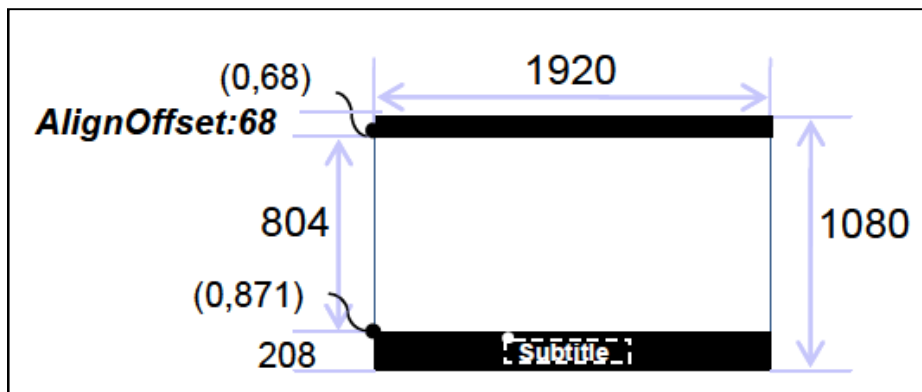


Figure 4 - Example of a bottom offset subtitle

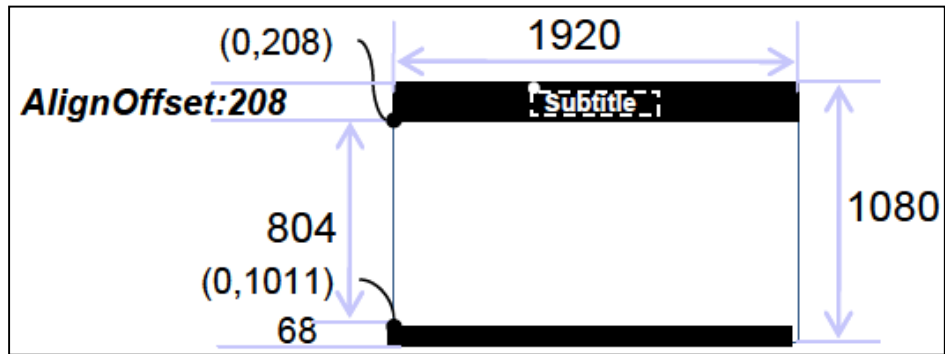


Figure 5 - Example of a top offset subtitle

Adding Chapters to Playlists

Path Items

When you add a Segment to a Playlist it becomes a Path Item. You can see the Path items nested in the tree under each Playlist.

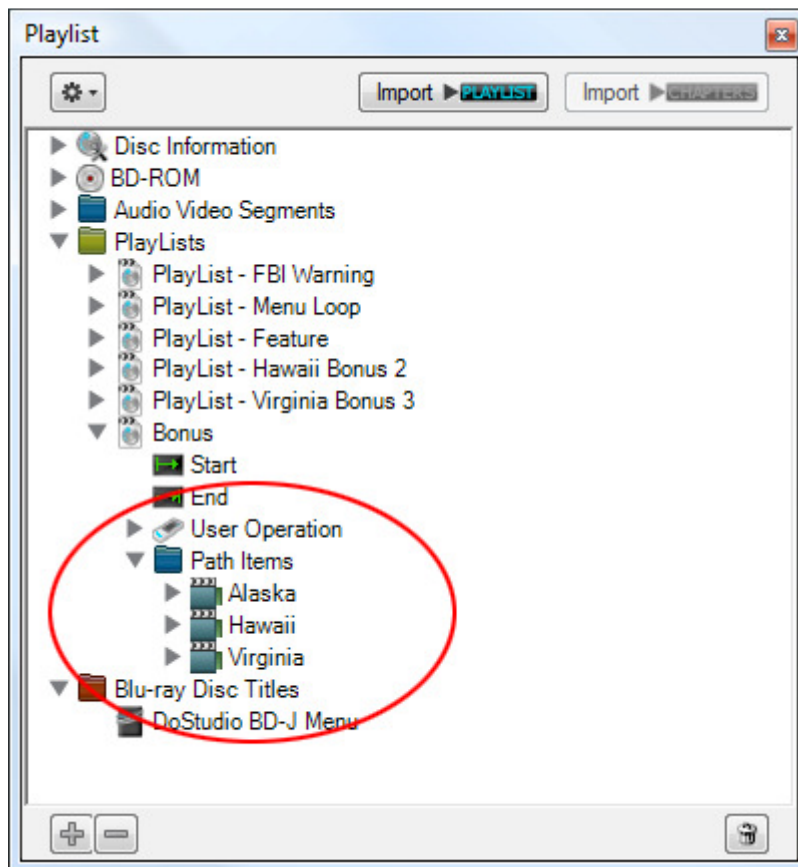


Figure 10.8 – Path Items

Adding Chapters to Path Items

Chapters are defined as a time code start point within a Path Item. To add a Chapter to a path Item, expand the tree view to see the chapters icon. Right click the Chapters icon and select “Add Chapter” from the context menu. A new chapter will appear in the tree.

Select the Chapter to edit set its time code value in the Control Panel. You must enter the time code value for the Chapter start in the form hours:minutes:seconds:frames.

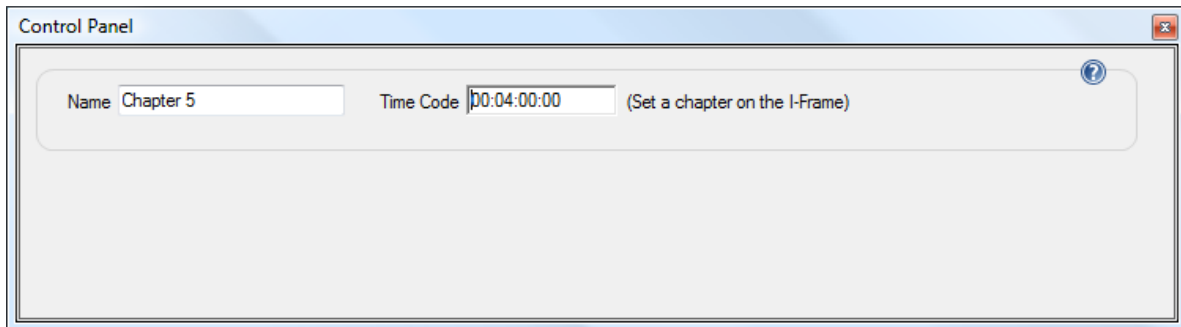


Figure 10.6 - Chapter Settings

Each new Chapter will be named sequentially as Chapter 1, Chapter 2, and so on. You can, of course, rename the chapter by typing a new name in the “Name” field in the Control Panel.

A Path Item can have up to 999 Chapters. By default each path item has one chapter at timecode 00:00:00:00.

Chapter 3: Setting up a Play-only BD Title

DoStudio Core 3D allows you to quickly setup a play-only BD Title without requiring you to author your own Movie Objects. This is useful for quickly creating review discs, dailies, or simple video loops. Core 3D is not suitable for discs that require branching or complex menu navigation.

Add the BD title

Right-click on the Blu-ray Disc Titles folder in the Playlist tree and select “Add BD Title” from the context menu. A new BD title will appear in the tree.

Add Playlists to the BD Title

You can add one or more Playlists to the BD Title by dragging them from the Playlist tree to the BD Title timeline. If you add more than one Playlist, the playlists will play in order from left to right.

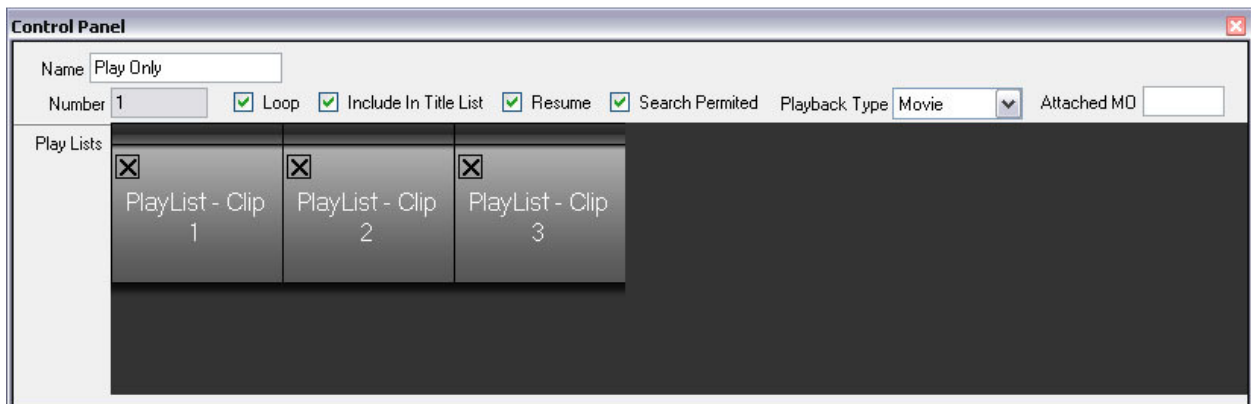


Figure 7 – A Play-Only BD Title that contains three Playlists

BD Title Properties

Name

You can rename the title by typing a new name in this field.

Number

You will notice that each BD Title has a unique number. Each new title has a number that is one higher than the previous title. If you delete a title, all of the titles below it in the tree are re-numbered so the title numbers remain sequential. *In Core 3D, you can only play BD Title 1. There is no need to ever add more than one BD title in Core 3D.*

Loop

Click this box if you would like the video to loop to the beginning of the first Playlist. If you do not select loop, the player will simply stop playback when it reaches the end of the Title.

Include in Title List

Checking this box includes the title in the Disc title list.

Resume

Checking this box sets the resume intention flag to “true” thus allowing playback of the title to resume at the point it was playing.

Search Permitted

Checking this box sets the Title Search flag to “True.”

Playback Type

Leave this combo box set to “Movie”

Attached MO

This field should be left blank when creating a Play-only HDMV title.

Chapter 4: Completing the 3D Disc

To set up your disc so it will play your 3D titles correctly you will need to setup the default settings correctly. To do this select Blu-ray Disc Titles in the Playlist tree. In Core 3D you will only see the Blu-ray Title Setup Tab in the Control Panel.

BD Title Information

When using DoStudio EX, the Blu-ray title setup allows you to specify the First Play and Top Menu titles in your project. In Core 3D, you will only create one BD Title. Use the combo boxes to select that title for the First Play and Top Menu titles.

BD3D Information

These settings only pertain to discs made with the 3D module. These settings tell the Blu-ray player what type of 3D video your disc contains and whether the disc should play in 3D mode on startup.

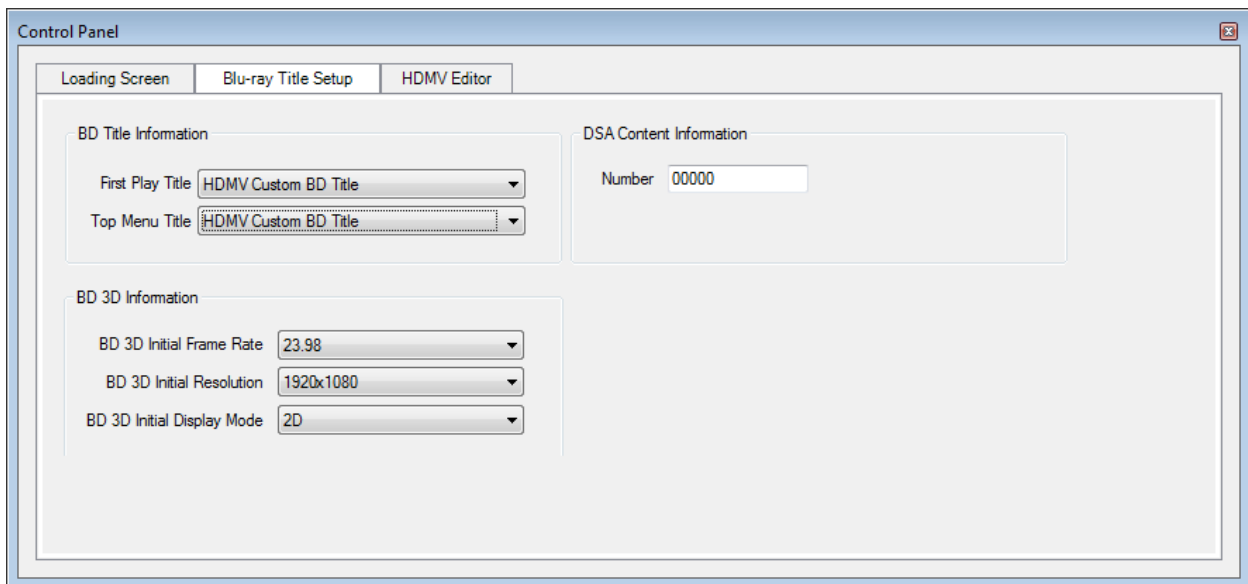


Figure 7 - BD 3D Information Settings

BD3D Initial Frame rate

This should match the frame rate of your video. The three options for BD3D are

- 23.98 (your video must be 1920x1080)
- 50 (your video must be 1280x720)
- 59.94 (your video must be 1280x720)

BD3D Initial Resolution

This should match the frame resolution of your video. The two options for BD3D are:

- 1920x1080 (your frame rate must be 23.98)
- 1280x720 (your frame rate can be either 50 or 59.94)

BD3D Initial Display Mode

In most cases, if you are making a BD3D you will want the start up mode to be 3D. If this is set to 2D your 3D video will display in 2D.

Compiling Your 3D Disc

Compiling

When you compile your Blu-ray disc with a 3D Playlist, DSA will automatically create an ISO that you can burn to a BD-R/RE or mount and play back on a softplayer. The ISO will be found in your .BD folder's 3DISO folder.

Formatting

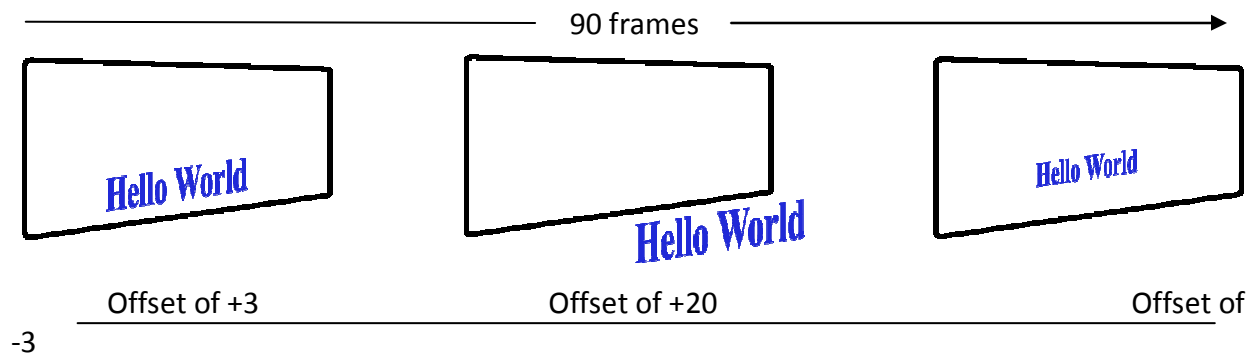
Formatting for replication is not supported in Core 3D. You must use DoStudio EX to format a BDCMF image for replication.

Appendix A – Metadata Offset File

3D Meta Text File *.do3d

The Do3D ASCII text file is used to position the subtitles on the screen so they can be a fixed 3D depth or they can move in 3D space as the video plays. Each line is treated as separate input line, blank lines are allowed and comments are allowed at the START of the line by using the pound key (#).

The .do3D Text file is based on a sequence of depth offsets for duration of frames as seen in below.



For every duration of frames (DOF) there must be the same number of offset sequences (NOS). In the above picture there are 3 offsets. This means that it is important to group the various changes in depth into equal numbers. For example; if we have a 2 minute video at 24fps and there are 100 different offset depth values. I can group them into 10 NOS every 288 frames. (In all likelihood this wouldn't work out so evenly and the DOF will vary). Each NOS is a positive or negative number indicated by + or – without a space between the number. For example +1 or -3.

The .do3D file doesn't have any information that points directly to the .dost file. The reason for this is that the two are completely independent allowing for the CE players to play back the subtitles on both 2D and 3D players.

The .do3D file is also used to create a depth map for the BD-J and HDMV menus. This allows the menus to move with the 3D video.

The .Do3D HEADER

The header is very basic with just three important values:

#Version must be set to 1.00

Version 1.00

#NumrOfOffsetSequence will indicate the number of NOS per DOF.

#This means that EVERY DOF will have this number.

#In this case every DOF will have 10 NOS

NumerOfOffsetSequence 10

Default offset direction used for those frame not described in this script.

Number of offset should be the same as NumOfSequence

DefaultOffset +1 +5 +10 +15 -1 -5 +15 +2 +10 +4

The .Do3D Body

The body is a list of DOF NOS per line and each line is based on the previous DOF. Using our example of 10 NOS every 288 DOF we would have the first DOF be 288 and the next DOF 288 and so on. After the DOF have a tab character and then the NOS. For example:

#DOF NOS

0 +288 +12 -5 + 14 -7 +1 +5 +15 -5 -15 -30

289 +288 +5 -7 +1 -5 +5 -15 +2 -30 -4 +5

577 +288 +12 -5 + 14 -7 +1 +5 +15 -5 -15 -30

If the DOF isn't even then we'd have the following

#DOF(tab)NOS

This indicate starting at 0 to 30 frames in the DOF

0 +30 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

This indicate starting at 31 to 120 frames in the DOF

31 +89 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

This indicate starting at 121 to 150 frames in the DOF

121 +29 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10