

Possibilities of DCP (Digital Cinema Package) at Studio FAMU

In connection with the transition of FAMU projection to DCI technology, DCP is expected to be the main output format for school exercises.

DCP is also the most suitable format for both domestic and foreign festivals.

To produce DCP, it is possible to use DaVinci Resolve Studio, version 15 or higher.

In this version, it is possible to export full-featured non-encrypted DCP without the need for a special licence for DCP export.

At Studio FAMU, DaVinci Resolve Studio version 15 is installed at the Grading suite — room 3113, and at the Editing suite — room 3109.

It is relatively easy to export (output) DCP from DaVinci Resolve. You can directly input the project timeline that you are grading, or you can import an already completed master in a higher bit rate, e.g. ProRes 422 HQ, ProRes 4444, or a tiff sequence.

In DaVinci Resolve, you can also master DCP with multi-channel audio. Multi-channel audio can be embedded in the input master, e.g. ProRes mov, or you can import individual audio tracks as wav files.

Note: The technical quality of the resulting DCP will correspond to the quality of the input video and audio files.

One limitation is that the resulting DCP from DaVinci Resolve cannot contain a separate subtitle track (DaVinci Resolve does not support subtitles in xml format).

Subtitles must be burnt-in directly onto the image. In DaVinci Resolve, subtitles can be inserted directly into the picture from the input srt format.

For multilingual subtitle versions, a separate DCP must therefore be produced for each language subtitle version.

Another limitation is that the resulting DCP cannot be encrypted.

Procedure for DCP production in DaVinci Resolve Studio, version 15 or higher

(This procedure requires at least basic knowledge of DaVinci Resolve.)

1. Set the timeline resolution — the DCI standard specifies 2 basic projection formats: DCI flat and DCI scope. Set the desired resolution in Master Settings. If the material is in full HD resolution, the closest setting is DCI Flat 1.85 1998 x 1080.

2. Set the fps timeline according to your input materials — video and audio must have the same fps; the original DCI standard 'Interop' allows only 24 fps, while the newer 'SMPTE' standard allows both 24 fps and 25 fps.

Some older cinemas are not able to play DCP with 25 fps!

3. Import your film — both picture and sound — in the best possible quality, image either as a tiff or dpx sequence, or as a mov file, e.g. ProRes 422 HQ, ProRes 4444, DNxHD 220, DNxHR, etc.

Multi-channel audio as individual wav files, or embedded in the movie.

Individual audio tracks must be properly named and in the correct order — the naming convention and order is: L, R, C, LFE, Ls, Rs

The soundtracks for DCP need to be properly prepared during audio production — the resulting sound mix for cinema projection (i.e. also for DCP) has prescribed levels different from the standard mix for TV or the Internet!!!

4. Create a timeline from the imported picture and sound

A/ video with embedded 5.1 audio — one video track and one audio track 5.1

B/ picture and sound are separate — one video track and 6 audio tracks need to be inserted into the timeline in the correct order – L, R, C, LFE, Ls, Rs

5. For case B/, map the multi-channel audio — set in the Fairlight module:

Set the Bus Format at 5.1

Link Group — select all 6 channels and set link as 5.1

6. Creating and exporting DCP — in the Deliver module:

Video settings:

Format: DCP

Codec: Kakadu JPEG2000

Type: e.g. 2K DCI Flat

Maximum bit rate: the standard allows a maximum of 250 Mbit/s, it is recommended to use a value of 150–200 Mbit/s

for 25 fps, do not check 'Use interop packaging', as this will create SMPTE DCP.

Audio settings:

for one 5.1 track (audio was embedded in the source movie — type A/)

Set Output Track to Timeline Track

for 6 separate audio tracks (audio was imported as 6 wav files — type B/)

Set Output Track to Main 1 (5.1)

Generating DCP name by convention:

DCP is a folder in which there are several files — picture, sound, and various metadata.

DCP must be properly named. The DCP name contains information important to the operator of the digital projector (projectionist) — type of show, projection format, language version, etc. — so that the projectionist can correctly set the projector and screen masking.

Use the Name Generator to generate the name according to the conventions.

Procedure: On the Deliver/Video/Composition name tab, press the Browse button and the Name Generator interface will appear. Fill in the necessary parameters (more about naming conventions at <https://isdcf.com/dcnc/>).

Copy the final name from the Name Generator to the Deliver/File/Custom name field.

7. Run Render (Add to Render Queue and Render).

Note: Once the render has finished, DCP is saved according to the specified path.

The resulting DCP should be checked for quality by playing back in DaVinci Resolve.

The file size is approximately 1GB per 1 minute of film (for 2K).

If the DCP is sent via the Internet, it is advisable to zip the entire DCP in advance.

DCP-o-matic

In addition to DaVinci Resolve, the freeware program for DCP production, DCP-o-matic (versions for Windows, Mac OS X and Linux) can be used, which can be downloaded here: <https://dcpomatic.com/download>.

The user manual is available here: <https://dcpomatic.com/manual/pdf/dcpomatic.pdf>.

Setting of variable parameters is similar to DaVinci Resolve:

DCP:

Use ISDCF name: check

Content type: according to the content – usually “Short”

Reels: One reel

Standard: Interop (24 fps) or SMPTE (24 or 25 fps)

Video:

Container: for full HD source – DCI Flat (1988x1080)

Resolution: for full HD source – 2K

Frame rate: according to source 24 or 25

Bandwidth: for 2K – 150-200 Mbit/s

Audio:

Channels: 6 – 5.1

Processor: none

As with DaVinci Resolve, in DCP-o-matic it is also necessary to pay attention to the quality of the input materials and the right level of modulation of the audio tracks. Resulting DCP should be checked for quality by playing back in DCP-o-matic Player (part of the installation package).

If you have technical issues or any questions about exporting a film to DCP format, please contact the Studio FAMU staff:

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