DIGITAL FILE DELIVERY – WHITE PAPER VERSION 0.1 (12/10/2012)

1. General idea

Considering:

A. The market penetration of blu ray players and the general compatibility of many - standalone and software- players with regards to the H264 codec.

B. The well described specifications of the blu ray standard.

C. The good to very good quality of H264 coded video information

*We have decided to base our recommendation upon the blu ray standard.*

2. Preparation of content

Content should be presented in such a way to ease the screening of the film within compilations and to help projectionists avoid mistakes and annoying images/sounds/beeps that shouldn't be present.

Content should be:

- As close to the original source possible (as long as it complies with all following guidelines). So: no letterboxing, conversion to other frame rates, …
- A 5 second "black" with no sound should precede the actual content. No countdown clocks, no color bars, no "beeps" should be included in the delivered file/disc.
- If subtitles are hardcoded into the video, subtitles should be in the actual (useful) video, and not in the black bar below or above.
  Eg: if a film is in scope format and delivered on 16/9. Subtitles (if hard coded) should NOT be in the black bars below the image, but in the video information itself.
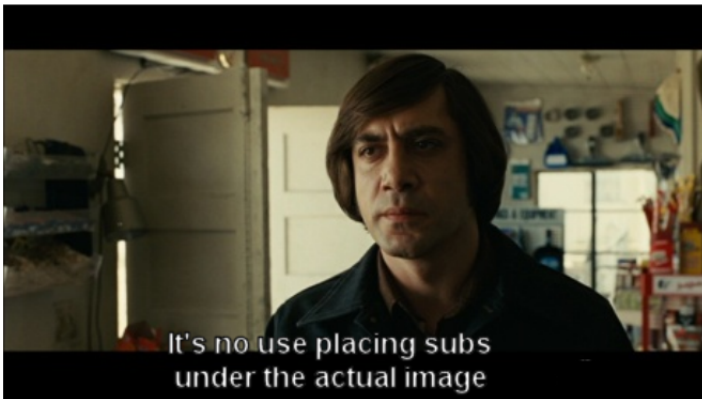
3. Container

2.1 If on blu ray disc:

- **MUST** Standard Disc Size, Single Layer (max. 25 GB)
- **MUST** Fully compatible with both standalone players and software players
- **PREFERRED:**
  - o Disc starts with root/top menu, infinite loop.
  - o Menu shall mention :
    - Title of film
    - Aspect Ratio
    - Frame Rate
    - Available sound mixes (2.0, 5.1 or 7.1) (default shall be 2.0)
  - o <START FILM> button is highlighted on default.
  - o Disc can be started by pressed the physical PLAY button on a standalone player

2.2 If on separate file:

- **MUST** Fully compatible .m2ts file.
- **MUST** Each film shall consist of 1 file.
- **MUST** The naming of the file shall be compliant with rules mentioned in 2.2.1

2.2.1 Naming Convention of files

(based on Digital Cinema Naming Convention http://digitalcinemanamingconvention.com/)

2.2.1.1 General Structure

NAME-OF-MOVIE_ASPECTRATIO(*LETTERBOXED*)_FRAMERATEFPS_AVAILABLESUBS_SOUNDMIXES.M2TS

NAME-OF-MOVIE : (Internationally and/or commonly used) Film title, maximum of 20 characters. No accents, only alphanumerical tokens, no spaces (spaces shall be replaced by minus signs "-"), no special chars (- , . @ # | ; * …).

ASPECTRATIO: Mentions the aspect ratio of the "useful" video information as recorded in the file. *Eg: if a 16/9 video is letterboxed within a 4:3 frame, aspect ratio shall mention 16-9 (although letterboxed video should be avoided at all costs)[1]*

Common aspect ratios:

- o **4-3** : "Older tv" format (1:1.33)
- o **166** : Older European Cinema standard (1:1.66)
- o **16-9** : "New tv" format (1:1.78)
- o **185** : Common Cinema Format (1:1.85)
- o **SCOOP** : Widescreen cinema format (1:2.39)

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[1] 4:3 video on blu ray format is only supported on SD (Standard Defintion) video. SD video should be avoided as well if possible.

LETTERBOXED: Letterboxed shall be added in the (to be avoided!) case of a 16/9 video letterboxed within a 4:3 frame. (There is actually never a good reason to do this)

FRAMERATE : Mentions the frames rate, as well as progressive (P) or interlaced (I). All possible frame rates:

- **25I**FPS
- **30I**FPS : this also includes 29.97 frame rates.
- **24P**FPS : this also includes 23.976p frame rates
- **25P**FPS
- **60P**FPS : this also includes 59.94p.

AVAILABLESUBS : List of all available (if any) subtitles. Only to be mentioned if subtitles are hard coded (not removable, "burned in" the video) OR when part of the .m2ts file. NOT to be mentioned if separate subtitle file(s) is included (.srt or .ssa, see below).

2- or 3-lettre abbreviation (see appendix 1) shall be used. If multiple subtitles exists, different version shall be separated by minus (-) sign. *Eg: EN-NL-FI : Subtitled in English, Dutch and Finnish*

SOUNDMIXES : List of all encoded soundmixes. If multiple streams are available, the order of the streams within the m2ts shall be reflected in the order within the naming of the file. (However stereo (2.0) mix should be the first (and default) stream).

Eg : If a stereo (2.0) and a Surround (5.1) stream are present " 20-51 " shall be added.

Possible sound mixes:

- **20** - Stereo : A stereo mix should ALWAYS be present and ALWAYS be the first and default stream.
- **51** – 5.1 Surround sound with Left, Right, Center, LFE (subwoofer), Left Rear Surround, Right Rear Surround information
- **71** – 7.1 Surround sound. As 5.1 but with addition of Left Surrond and Right Surrond

4. Video Codec

Used video codec should be 100% compatible with the H264 codec and specifications used for blu ray disc.

- H264 Format
- High Profile
- Maximum Bitrate of 40 Mbit/s
- Maximum AV bitrate (combined audio and visual bitrate) of 48 Mbits

5. Audio Codec

Used audio codec should be 100% compatible with the Dolby codec or PCM codec and specifications used for blu ray disc.

- Linear PCM (LPCM) up to 8 channels (7.1), uncompressed audio
- Maximum bitrate of 27Mbit/s
- However: maximum AV bitrate (combined audio and visual bitrate) of 48 Mbits

OR

- Dolby Digital. Up to 6 channels (5.1)
- Maximum bitrate of 640 kbit/s
- Maximum AV bitrate (combined audio and visual bitrate) of 48 Mbits

6. SUBTITLING

Hardcoded subs are ok to use, but you'll have to render a new language version if needed. Much easier is to use internal subs within the m2ts OR external subs (if you send a file) in the .srt or .ass format.

(this section has to be elaborated).