

NCM's FirstLook preshow is distributed to nearly 20,000 digital screens in the United States. Soon, teams at NCM will begin migrating FirstLook programming from an exclusive playback device (DCN/DTDS) to a Digital Cinema playback server, the same system used to show motion pictures. This advancement in playback technology will happen in a number of theaters across our network, but not all, and will provide our customers and movie audiences across the nation an enhanced preshow entertainment experience. The chart below offers descriptive notes on what attendees can expect to see as NCM innovates into the world of Digital Cinema production.

Video/Audio input	FirstLook Digital Cinema (DCP)	Observations
Video Resolution	1080P	1080P resolution is the international, full HDTV broadcast standard. Horizontally, it is just 4% shy of a 2K image. With a theater's masking set to FLAT, a slight black margin may be observed on the left and right sides of the video image.
Aspect Ratio	16:9	16:9 is the international HDTV broadcast standard. It displays nicely with the theater's masking set to FLAT.
Frames/Sec. (fps)	23.976 or 24	23.976 fps is the U.S. broadcast standard for full HDTV progressive frame playback. This frame rate most often converts well to other broadcast standards; however, other fps broadcast standards (29.97, 30, 59.94, 60) do not always convert well to 23.976. Observable defects might be video frames that appear to stutter or jerk, especially on "panning" camera shots, as well as visible and unwanted visual motion artifacts.
Audio Channels	5.1	5.1 audio is discreet, making sound placement exact to the audio mixers creative vision. A quality 5.1 mix will playback with a full, dynamic, rich sound.
Audio Playback Level	75dBc +/- avg.	75dBc is 10dBc lower than trailers, allowing patrons to converse without difficulty prior to the main feature.
Colors Displayed	68.7 billion max. <i>12-bit color – 4:4:4</i>	Color should display as the director's or visual artist's original intent and not appear changed or washed out. Standard broadcast playback is inferior to this color standard.

Even though NCM's technical infrastructure is evolving, we are committed to making this transition easy for our clients. FirstLook will continue to be the highest quality preshow entertainment program built for cinema; however, our technical requirements remain the same as most other HDTV broadcast advertising outlets.*

NCM's preferred a/v spec: **

Video				Audio			
File Type	Resolution	Frame Rate	Codec	Channels	Compression	Sample Rate	Bit Depth
.mov	1920x1080 1080P	23.976/ 23.98 or 24	Mac: Apple ProRes 422 (HQ) Win: Avid 10-bit 175 DNxHD	5.1 + Lt/Rt	Mac: PCM* .aif Win: PCM* .wav	48 kHz	24-bit
Set bitrate to "Constant," not "Variable" when rendering out a/v file.							

If your spot was NOT originally shot or natively created at 1080P / 23.976, 23.98 or 24fps, **PLEASE DO NOT** convert the spot to meet our preferred a/v spec. NCM will convert the spot for you using our Snell and Wilcox Alchemist standards converter. The Alchemist's motion compensated converters offer award winning technology that delivers the cleanest and most detailed conversions, even with the most dynamic content.

Please contact **Judy Duke**, Senior Manager of National Sales Operations at 303-792-8702 with specific questions that you may have, or visit NCM's online production resource center at <http://adspecs.ncm.com> for more information. See appendix for a detailed chart comparing FirstLook DCN/DTDS to FirstLook DCP playback standards.

*NCM reserves the right to reject advertising materials based on the appropriateness of content as well as overall visual and audio quality of the materials submitted. Other restrictions may apply. **For detailed technical specifications on Optimal Audio Materials to Provide to NCM, FirstLook Playback Environment and Volume Level, refer to NCM's National Advertising Guidelines and Specifications document that can be found at <http://adspecs.ncm.com/content/files/NationalContentSpec.pdf> v05.11.2015

NCM's FirstLook preshow is distributed to nearly 20,000 digital screens in the United States via satellite. Our exclusive media playback device (DCN/DTDS) ingests individually encoded audio visual (a/v) files that contain both the video and surround audio channels in a single file for each advertiser and network content provider. This solution ensures advertisers consistency in audio integrity, volume leveling, and visual playback between auditoriums of our various theatre partners.

GENERAL STATEMENT (GS)* Optimal Audio Materials to Submit to NCM: *we strongly recommend submitting both 5.1 and Lt/Rt mixes in the following channel designation - 1. Left 2. Right 3. Center 4. LFE(sub) 5. Left Surround 6. Right Surround 7. Lt 8. Rt.* Even though the NCM network plays back Lt/Rt, we use the client's Lt/Rt and the 5.1 as a reference to make sure the client is getting the best mix possible before the file is distributed to theaters. Many professional audio mixers create "near-field" mixes for home broadcast; however, mixing for the theater is unique to NCM. NCM's audio engineers are experts in surround audio mixing for the "large-field" environment and have the ability to re-master the client's submitted 5.1 into an enhanced Lt/Rt - keeping the original creative integrity intact, but sweetening elements of the mix that may seem out of place or lost in the mix.

(GS) FirstLook Playback Environment: Audio is decoded in a cinema-surround, Lt/Rt format. Each auditorium's cinema processor decodes the 2-channel mix to the Left, Right, Center, mono Surround and Sub speakers using Dolby ProLogic. While Lt/Rt decodes in a cinema-surround format, it does not playback as discreet, 5.1 audio.

(GS) FirstLook Volume Level: The set volume playback level has a mean average of 75dBc, or 10dBc lower than the trailers that follow our program. This is because our theater partners require that movie patrons be allowed to hold a comfortable conversation level prior to the movie beginning; yet 75dBc establishes a high level of audience engagement while enjoying the preshow. An advertising spot that is driven mostly by voice-over dialogue will likely meter at an average of 70-75dBc, while a spot with a full-frequency music bed and audio effects will likely average in the 75-80dBc range.

FirstLook Programming Quality Control:

- **Post-Production** – prior to distribution, all content is reviewed four times by post-production personnel. The first two assessments involve the professional audio engineer and the digital video encoding technician assigned to the content. The engineer pinpoints nuances individual to each audio mix, ensuring that center channel dialog is intelligible and that frequency separation between music, sound effects and dialogue is optimum based on the materials provided. The encoding technician looks for video issues such as interlacing, unwanted video noise, color imbalances, etc. Technical issues that can be corrected are done so internally before the content is distributed, while issues that cannot be fixed are reported back to the agency or client for corrective action. The final two checks are overseen in NCM's surround-sound screening facilities by post-production team management. Each check takes place in a separate room to ensure that audio decodes correctly, and that video hues, gamma, and saturation levels are acceptable on differing systems before the content leaves the facility.
- **NCM Field Operations Technicians** perform preventative maintenance regularly in theaters. Audio is checked in each auditorium using a sound pressure meter (SPL) to ensure that playback levels meet the established 75dBc standard. Additionally, pre-leveled "pink noise" is played through each audio channel and measured to ensure all speakers are calibrated correctly. If an issue is discovered during any portion of the audit, a trouble ticket is generated and a technician is dispatched to recalibrate the theater to meet NCM's acceptability standards.
- **Third-Party Auditing Services** – in order to provide impartial feedback on pre-show playback quality, NCM employs third-party auditing services to report back on program playback quality, including audio level acceptability.
- **AudioTrax (ATU)** – NCM has deployed over 1500 AudioTrax devices across our network to measure FirstLook volume levels. If an alert or error code is received in our Network Operations Center (NOC), corrective measures are initiated by engaging on-site theater management or dispatching a theater technician to the alerted site.
- **Exhibitor Technical Staff** perform quarterly calibration tests on in-theatre audio and visual equipment. Any theater auditorium that is identified as "out-of-range" is recalibrated to standardized playback levels.

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NCM FirstLook	“Present-day” DCN/DTDS Playback (.trp)	“Coming Soon” Digital Cinema Playback (DCP)	2K Movie Trailer Playback (DCP)	Notes
Video Resolution	1280x720 (720P)	1920x1080 (1080P)	Flat 1998x1080 Scope 2048x858	1080P is a Digital Cinema Initiatives (DCI) compliant resolution; 720P is not. Horizontally, 1080P is just 4% shy of a Flat 2K image.
Aspect Ratio	1.77:1 (16:9)	1.77:1 (16:9)	Flat 1.85:1 Scope 2.35:1	Both program types follow the international HDTV broadcast standard.
Frames/Sec. (fps)	59.94	23.976 / 23.98 or 24	24	23.976 is the U.S. broadcast standard for Full HD, progressive frame playback, whereas 59.94 is the U.S. broadcast standard for 720P playback. 720P was adopted by most cable broadcasters and TV manufacturers when HDTV initially rolled out; however, most HDTV units and professional video capture devices sold today are 1080P. Since 1080P/23.976 fps offers the highest quality HDTV production value, and this standard converts nicely to other HD broadcast standards, and the cost to produce is negligible compared to other HD standards, NCM recommends that all HD content be natively produced and provided at 1080P/23.976.
Audio Channels	2 (Lt/Rt)	5.1 (discreet)	5.1(+)	Lt/Rt integrates Dolby Pro Logic surround sound. The sound is unwrapped from two channels to the left, right, center, mono rear surrounds, and subwoofer; however, sound elements within the mix can bleed into other channels making sound placement imprecise. 5.1 audio is discreet making sound placement exact. When comparing Lt/Rt and 5.1 audio at identical volume levels, the 5.1 mix will have a fuller, more dynamic sound.
Audio Playback Level	75+/- avg.	75+/- avg.	85+/- avg.	FirstLook’s volume level plays at a mean average of 75dBc via SPL measurement. This sound pressure level is 10dBc lower than trailers.
Max. No. Of Colors Presented	16.7 million	68.7 billion	68.7 billion	DCPs are encoded at a 4:4:4 chroma subsampling rate. MPEG2/TRP files are encoded at a 4:2:0 chroma subsampling rate. 4:4:4 is the highest-quality format for preserving color detail accuracy. Vibrancy, saturation, gamma levels, etc. should be expected to display exactly as the director or visual artist intended them to look.

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