

Standard Definition
Commercial File Delivery
Technical Specifications
(NTSC)



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This document provides technical specifications for those producing standard definition interstitial content (commercial and PSA's) for playback on the ABC Television Network. ABC will not normally modify any supplied audio or video parameters, providing the following technical requirements are met. ABC reserves the right to reject materials that are delivered with parameters exceeding the specifications outlined in this document.

Summary of Technical Specifications

- The file delivery format for delivery to ABC is LXF for playout on ABC's Nexio server farm. Details about the file format are specified in Section 2. We are in the process of migrating to MXF XDCAM HD file format and will be working with all vendors individually on migration to a new file format in coming months.
- Video levels recorded to output an encoded NTSC(SD) signal with:
 - Luminance level absolutely no higher than 110 IRE.
 - Combined luminance and chrominance peak level absolutely no higher than 120 IRE.
 - Negative chrominance peak level absolutely no lower than -20 IRE.
- 2-channel stereo or 5.1 channel audio accepted.
- **ABC will now accept Audio Description or SAP (Spanish Language) audio on short form content.** See Section 3.2 for REVISED audio track configurations.
- **A mono-mix is now required on audio track 7 if Audio Description or SAP is not delivered.** See Section 3.2 for REVISED audio track configurations.
- ABC has adopted standards, and has implemented methods and procedures to control the overall loudness of its programs and interstitial content in accordance with the CALM Act. The Advanced Television Standards Committee (ATSC) has released a recommended practice: A/85 - Techniques for Establishing and Maintaining Audio Loudness for Digital Television. ABC has adopted these recommendations.
- *In accordance with the ATSC recommended practice and the CALM act, ABC will adopt the current recommendation for audio loudness of -24LKFS (+/- 2 dB) measured for the length of the delivered spot. A loudness meter based on ITU-R BS.1770-2 incorporating all channels except the LFE channel should be used for this measurement. (ABC recognizes that this methodology of measuring loudness is new to the industry and that best efforts to conform to this standard should be adopted).*
- As the method for delivery of content is primarily file based, ABC will be using file based QC methods to measure and correct loudness, if necessary. File based methods are the best, and most accurate, methods of checking and correcting loudness discrepancies, without the loss of dynamic range.

- The absolute maximum peak audio levels of brief and only occasional instances are **not to exceed -6 dBFS. ABC reserves the right to either reject or correct audio levels that are not consistent with this specification.**
- ABC will be operating under a fixed dialnorm paradigm.
- Color bars shall be 4:3 aspect ratio SD bars, not down-converted HD bars.
- Bars and tone must accurately represent video and audio levels of material.
- Slate/countdown of at least 8 seconds, to conclude 2 seconds before start of spot material. See Section 4.3. This requirement may be altered or omitted entirely in the future. Vendors will be notified in advance of any upcoming changes.
- Spot material to be followed by video black and silent audio.

1. References

1.1. Normative References

The following standards and recommended practices are referenced in this document. In those cases where a referenced document disagrees with this document, this document will be considered to be correct.

- IEC 60268-18 *Sound system equipment – part 18: Peak programme level meters – Digital audio peak level meter*
- ITU-R BT.601-5 *Studio Encoding Parameters of Digital Television for Standard 4:3 and Wide-Screen 16:9 Aspect Ratios*
- SMPTE 12M *Time and Control Code*
- SMPTE 256M *Specifications for Video Tape Leader*
- SMPTE 229M *Television Analog Recording – ½ inch Type L -- Records*
- SMPTE 230M *Television Analog Recording – ½-inch Type L – Electrical Parameters, Control Code and Tracking Control*
- SMPTE 238M *Television Analog Recording – ½ inch Type L – Tapes and Cassettes*
- SMPTE 244M *System M/NTSC Composite Video Signals – Bit Parallel Interface*
- SMPTE RP 148 *Relative Polarity of Stereo Audio Signals*
- SMPTE RP155 *Audio Levels for Digital Audio Records on Digital Television Tape Recorders*

1.2. Informative References

The following documents are cited for informational purposes.

- EIA-608B *Recommended Practice for Line 21 Data Service*
- SMPTE 125M *Component Video Signal 4:2:2 – Bit-Parallel Digital Interface*
- SMPTE EG 1 *Alignment Color Bar Test Signal for Television Picture Monitors*

SMPTE RP219 *High-Definition, Standard-Definition Compatible Color Bar Signal*
ITU-R BS 1770-1 *Algorithms to Measure Audio Programme Loudness and True-Peak Audio Level*
ATSC A/85 - Techniques for Establishing and Maintaining Audio Loudness for Digital Television.

For the latest revisions of the above-referenced standards documents, please consult the following websites:

SMPTE: www.smpte.org

ITU: www.itu.ch

IEC: www.iec.ch

EIA: www.ce.org

2. Delivery Format

2.1. Standard definition content for broadcast shall be delivered to ABC as a file.

2.1.1. The file type should be either LXF or MXF 525i content @29.97i frame rate. ABC's server farm for playout of program content is based around the Harris Nexio platform. All delivered files must be compatible with playout on the Nexio Platform.

2.1.2 Encoding

2.1.2.1 All LXF files should be video encoded MPEG-2 422P@ML I-Frame at a data rate of 30Mbps

2.1.2.2 All MXF files should be encoded MPEG IMX at a data rate of 30Mbps

2.1.2.3 All audio should be recorded uncompressed, at a sampling rate of 48KHz and at a preferred bit depth of 20 bits

2.1.2 File Delivery Location

2.1.2.1 Contact ABC via e-mail for instructions on the file delivery location

Contact: ABCTV.DL-Commercial@disney.com

2.5.4 File Naming Convention

2.5.4.1 Commercial will be named with the ISCI or Ad ID number {12 characters}. When re-delivering modified spots with the same ISCI number ABC must be contacted to purge an already existing spot. If the spot is not previously purged the redelivery process will fail

3. Format Specifications

3.1. Video

3.1.1. Luminance and chrominance levels recorded on file shall be maintained such that a properly calibrated playout device will output an NTSC signal with a peak luminance level absolutely no higher than 110 IRE, a combined positive chrominance and luminance peak level absolutely no higher than 120 IRE, and a negative chrominance peak level absolutely no lower than -20 IRE.

3.1.2. Files containing excessive chrominance levels sufficient to generate artifacts in the encoded NTSC output of a properly calibrated playout device will be rejected.

3.2. Audio

3.2.1. Track Configurations

3.2.1.1. Track configuration for 2-channel audio:

1. Stereo L or L_T
2. Stereo R or R_T
3. Silence
4. Silence
5. Silence
6. Silence
7. Audio Description (if applicable) or Spanish Language (if applicable and Audio Description does not exist) **otherwise a mono mix**
8. Spanish Language (if applicable and Audio description is provided on track 7) **otherwise silence**

3.2.1.2. Track configuration for 5.1 channel audio shall be:

1. Left
2. Right
3. Center
4. Low Frequency Effects
5. Left Surround
6. Right Surround
7. Audio Description (if applicable) or Spanish Language (if applicable and Audio Description does not exist) **otherwise a mono mix**
8. Spanish Language (if applicable and Audio description is provided on track 7) **otherwise silence**

Note: Do not, under any circumstances, replicate or repeat channels to “fill” up or increase the number of audio tracks

3.2.2. Digital Audio Recording Characteristics

3.2.2.1 Digital audio shall be linear PCM with a sample rate of 48 kHz, locked to video. Bit depth shall be at least 20 bits.

3.2.2.2 Digital reference audio level signal shall be as specified in SMPTE RP 155: the digital representation of a 1000Hz sine wave at a level of -20 dB FS as indicated on digital audio meters.

3.2.3 Loudness

3.2.3.1 Digital audio levels and loudness must be measured with instrumentation complying with Recommendation BS.1770-2, "Algorithms to measure audio programme loudness and true-peak audio level," International Telecommunications Union, Geneva, April 2006 and adopted in the ATSC RP A/85 "Techniques for Establishing and Maintaining Audio Loudness for Digital Television". Instruments that conform to this standard provide a true peak level for digital audio, measured in dBFS (dB Full Scale), and an integrated audio loudness measurement in units of LKFS. Please see BS.1770 or RP A/85 for further details. Traditional VU or PPM meters do not provide a good measurement of loudness or instantaneous peaks. All channels except the LFE channel (4) are used to generate this measurement.

3.2.3.2 The target reference level for audio loudness is -24 dB LKFS, plus or minus 2 dB, but, as ABC now receives the vast majority of the interstitial content delivered via file based methods, a file based automated QC/Ingest system requires a threshold. Therefore, ABC reserves the right to reject and/or normalize the content, on an entire spot basis, on anything louder than -23 dB LKFS. This provides a 1dB tolerance in loudness over our specification with a much more accurate measurement. Quieter content (-24 dB LKFS and more negative) will not be normalized.

Important note on Measurement Considerations - Most BS.1770 instrumentation incorporates sliding time windows (moving averages) in their measurements. When measuring loudness, care needs to be taken to insure that long passages of low level audio and silence do not comprise a significant duration of the measurement time window.

3.2.3.3 Maximum true peak levels are not to exceed -6 dBFS, per BS.1770.

3.2.3.4 All audio channels of the 5.1, with the exception of the LFE, shall be measured.

3.2.3.5 For stereo material, both audio channels shall be measured.

3.2.3.6 For mono material, only the mono mix shall be measured.

3.3 ABC strongly discourages the use of electronic effects to create some sort of spatial imaging within a mix, i.e.; between the left and right channels. This has been known to cause problems with downstream processes.

3.4 ABC will under no circumstances accept any material that uses or simulates the Emergency Alert Signal (EAS). This is considered a fineable offense by the FCC and will be rejected immediately by ABC. Care should be taken in using any attention-getting content that makes light of emergency situations.

4. Ancillary Material and Signals

4.1. Time Code

If Time Code is part of the file, only Drop Frame time code will be accepted

4.2. Leader

This requirement may be altered or omitted entirely in the future. Vendors will be notified in advance of any upcoming changes

4.2.1. The video tape leader shall conform to SMPTE 256M and shall contain a minimum of 50 seconds of color bar test signal.

4.2.2. Color bars shall be 75/7.5 bars. 100% reference white and 0% black shall be included in the color bar test signal. For examples of standard color bars, see SMPTE RP219, High-Definition, Standard-Definition Compatible Color Bar Signal; and SMPTE EG-1, Alignment Color Bar Test Signal for Television Picture Monitors.

4.2.3. Color bars shall be 4:3 aspect ratio SD bars, not down-converted HD bars.

4.2.4. There shall be only one set of color bars and tone, and there shall be no audio or video preceding color bars and tone.

4.2.5. Signal-to-noise ratio measurement of signals output from a properly calibrated playout device, using a unified weighting filter, shall be at least 54 dB relative to 100% reference white.

4.2.6. The video tape leader shall contain 1000 Hz audio setup tone at reference level as specified above for digital formats for at least 30 seconds, followed by the sequence of audio tones for stereophonic audio channel

identification as specified in SMPTE 256M, Table 1, or other method to definitively identify stereo channels.

4.2.7. The audio signal-to-noise level relative to the reference level tone shall be at least 70 dB.

4.2.8. Relative inter-channel audio phase difference measured with sine wave tones shall not exceed 10 degrees at any frequency within the audio pass band of 20 Hz – 20 KHz.

4.2.9. The video and audio test signals in the leader shall accurately represent the program material with respect to video and audio levels, weighted video signal-to-noise ratio, relative audio phase, and audio signal-to-noise ratio.

4.2.10. Program video and Vertical Interval Test Signal (VITS) levels and phases shall match within a tolerance of ± 2 IRE and ± 1 degree respectively.

4.2.11. Peak video level of the color bar test signal shall not exceed 100 IRE.

4.2.12. Set-up (pedestal) level of the color bar test signal shall be 7.5 IRE.

4.3. Slate

This requirement may be altered or omitted entirely in the future. Vendors will be notified in advance of any upcoming changes

4.3.1. The slate portion of the leader shall include (at minimum) the following:

- Title of Sponsor/Product or Spot
- Commercial # (Ad-ID), PSA or Promo #
- Date of recording
- Audio Format (stereo, matrixed encoded surround sound)
- Closed Caption encoding (Spanish Language or English)
- Duration: Length of spot

4.3.2. A slate/countdown of at least 8 seconds duration shall conclude 2 seconds before the start of the content. A video black signal accompanied by silent audio shall be inserted between the end of the countdown and the start of first audio and/or video.

Note: If ABC has approved (see below) the inclusion of any material which has been embedded in the vertical blanking interval, the horizontal blanking interval, the audio, or the active video, the specifics must be noted on the slate.

4.4. Closed Captioning

4.4.1. English language closed captioning shall be recorded on CC1 (Line 21, Field 1); and Spanish language closed captioning shall be recorded on CC2 (Line 21, Field 1). Extended Data Services (XDS) data shall be recorded on Line 21, Field 2.

4.5. Video Tape Trailer

This requirement may be altered or omitted entirely in the future. Vendors will be notified in advance of any upcoming changes

4.5.1. There shall be at least 5 seconds of video black, time code, and silent audio following the conclusion of material.

4.6. Vertical Blanking Interval

4.6.1. The vertical blanking interval must be cleared of all extraneous signals.

4.6.2. Commercials and PSAs may not contain any material which has been embedded in the vertical blanking interval, the horizontal blanking interval, the audio, or the active video (e.g., Web TV interfaces), without prior written approval of ABC. Exceptions to this are listed below:

4.6.2.1. Line 14, both fields: VITC (including Ad-ID codes in user bits)

4.6.2.2. Line 15 both fields: Vertical interval reference (VIR) signal or Ghost Cancellation Reference (GCR) signal.

4.6.2.3 Line 16 both fields: Vertical Interval Test Signal (VITS)

4.6.2.4. Line 20 Field 1: NTC-7 Composite Test Signal

4.6.2.5. Line 21 both fields: Closed captioning plus XDS signals, per EIA 608A. Signals of the following nature are permitted without prior consent: CC1, CC2, and CC3, when these signals track dialogue; XDS signals of the current class except Program Description (packet types 10h to 17h) as described in EIA 608A and Content Advisory Content Advisory Packets (05h).

4.6.2.6 Line 18 Field 2 Co-Logo encoded Promotional content.

4.7 ABC does not allow or permit the embedding of watermarking services, whether in the ancillary data space or in the active audio/video portion of the content. Any additional data services (beyond BrandNet for promotional content and Closed Captioning in general) must be cleared with ABC TV Network management. This includes embedded services for commercial tracking or any other data transmission services whatsoever.