

**Technical Specifications for Broadcast
Program Material**

August 2018

Delivery Specifications:

- Fox Networks broadcast exclusively in 1280 x 720/59.94. All material shall be delivered per SMPTE ST 296:2012 with 5.1 digital sound per ITU-R BS 775-3 (08/2012)
- Loudness specifications per ATSC RP/A85 (Doc. A/85 12 March 2013)
- Programming that does not meet this specification is subject to rejection and correction at the supplier's expense

File Delivery:

- Fox Networks only accepts MXF file delivery standardized in SMPTE ST 377-1:2011
- The file name shall match the on air traffic I.D.
- SD file delivery requires prior authorization
- Stereo, 2-channel and monophonic deliveries require prior authorization

File Format Specifications:

- Files shall be wrapped in MXF per SMPTE ST 378:2004, OP1a
- Segments within the file shall be separated by a minimum of 2 seconds black
- MXF files shall have one MPEG-2 video stream per ISO/IEC 13818-2:2013
- MPEG-2 video essence shall be 1280 x 720/59.94, 4:2:2 profile @ high level, and 50Mbps
- 5.1 digital surround shall be in phase

Channel		Channel	
1:	Left	2:	Right
3:	Center	4:	LFE=Low Frequency Enhancement
5:	Left surround	6:	Right surround
7:	DVS, SAP or Mono	8:	Mono
9-12:	(n/a or not used)		

- MXF files shall have 8 audio PCM 16 (16 bits @ 48 kHz PCM) or 8 audio PCM 24 (24 bits @ 48 kHz PCM) channels per SMPTE ST 377-4:2012
- Dolby E is not accepted
- Programming shall be created such that any down mix from 5.1 to stereo or mono represents the original mix

Technical Specifications For Broadcast Program Material

August 2018

- The dynamic range of the material shall be suitable for television broadcast
- The loudness shall be measured across all channels, except LFE (*Low-Frequency Enhancement*) in units of LKFS per ATSC RP/A85 (Doc. A/85 12 March 2013)
- The Program must have an average loudness of -24lkfs, measured for the duration of the program, although if the material's loudness measures out of specification at any point, the material is subject to rejection.
- Audio true peaks shall not exceed -2dBFS
- If the material's loudness measures higher or lower than our loudness specification, the material will be subject to rejection
- SAP and DVS are subject to the above loudness and dynamic range requirements
- Monophonic audio shall be recorded on channels 1 and 2 and are subject to the above loudness and dynamic range requirements
- 2-channel audio material shall be clearly labeled as such and be recorded on channels 1 and 2, where the left channel is recorded on channel 1 and the right channel is recorded on channel 2
- Metadata specifications are shown on pg.3 of this specification

Videotape Delivery

- 1280 x 720p/59.94 videotape delivery shall be on Panasonic HD-D5 (3700B model or equivalent) or Sony HD Cam SR
- At the head of the material, a 30-second test signal of color bars per SMPTE RP 219:2002 and an audio test tone of 1kHz. at -20dBFS shall reflect the recorded material
- Stereo, 2- channel and monophonic deliveries require prior authorization

5.1 Audio Specifications

- 5.1 digital surround sound shall be in phase
- 5.1 audio channel assignments are same as file format on page 1
- Audio content shall be created such that any down mix from 5.1 to stereo or mono represents the original mix
- The dynamic range of the material shall be suitable for television broadcast
- The loudness shall be measured across all channels, except LFE (*Low-Frequency Enhancement*) in units of LKFS per ATSC RP/A85 (Doc. A/85 12 March 2013)
- The Program must have an average loudness of -24lkfs, measured for the duration of the program, although if the material's loudness measures out of specification at any point, the material is subject to rejection.
- Audio true peaks shall not exceed -2dBFS
- If the material's loudness measures higher or lower than our loudness specification, the material will be subject to rejection
- SAP and DVS are subject to the above requirements
- Discrete PCM channels on either HD D5 (8 Ch.) or HD Cam SR
- Dolby E is not accepted
- Monophonic audio shall be recorded on channels 1 and 2
- 2-channel audio material shall be clearly labeled as such and be recorded on channels 1 and 2, where the left channel is recorded on channel 1 and the right channel is recorded on channel 2

**Technical Specifications for Broadcast
Program Material**

August 2018

Metadata for File and Videotape Delivery

- All 720p/59.94 material shall be English closed-captioned with a resultant CDP of 52 or 59
- Additional language closed captions require prior approval
- No null services
- Closed caption CDP values shall follow SMPTE RP 2007:2007
- All descriptive packets shall be valid
- Files shall have CEA-608/708 captions per SMPTE ST 334-1:2007 & SMPTE ST 334-2:2007 in ANC packet per SMPTE ST 436-1:2013
- Closed-captioning data shall be encoded in the Vertical Ancillary data region (VANC) of the HD material, as per SMPTE ST 334-1:2007 and EIA 708B. The 708B packet shall include 608 legacy bytes (EIA-608E, line 21 CC data) and be converted from the 608-authored data. The allowable character standard set shall be the ANSI/CEA-608-E, with the following exceptions:

	Allowable	Do Not Use
Line Placement	Top Third, PAC Row 1 to 4 Bottom Third, PAC Row 12 to 15 <i>(2 rows maximum, each)</i>	Mid--Screen, PAC Row 5 to 11
Characters	Transparent Space	“”,” “#,” Registered Trademark and Trademark symbols, Tab offset, Delete to End of Row, and backspace
Style	White on Black characters	Paint--on style or mixed styles

AFD

- Material shall include a consistent AFD code of 1010 (letterbox) or 1111 (centercut) per SMPTE ST 2016-1:2009 & SMPTE ST 2016-2:2009
- HD material that has no AFD code shall be broadcast as letterbox (1010)
- HD material with a special AFD request must be approved by Operations
- AFD and bar data information per SMPTE ST 2016-1:2009, carried in ANC per SMPTE ST 2016-3:2009

Time Code

- All material shall have drop frame time code per SMPTE ST 12-1:2014 & SMPTE ST 12-2:2014

Time Code Conditions for File Delivery

1. The edit rate indicated in the MXF header metadata must match the MPEG frame rate of the sequence
2. The frame rate of the MPEG GOP start timecode must match the MPEG frame rate of the essence
3. The field phase bit of the MPEG GOP timecode must be set for odd numbered GOP start frames in 60 frames per second timecode
4. The drop frame bit of the MPEG GOP timecode must be set according to the MPEG frame rate of essence and non-existent drop frame counts must not be present
5. The frame rate of the SMPTE timecode must match the MPEG frame rate of the essence

Technical Specifications for Broadcast Program Material

August 2018

Time Code Conditions for File Delivery (continued)

6. The field phase bit of the SMPTE ST 328:2000 timecode must be set for odd numbered frames in 60 frames per second timecode
7. The drop frame bit of the SMPTE timecode must be set according to the MPEG frame rate of the essence and non-existent drop frame counts must not be present
8. The SMPTE 328 must be continuous and must match the presentation time of the MPEG picture, not the encoder order
9. The material package timecode and the file package timecode in the MXF header must match the SMPTE 328 timecode
10. The GOP start timecodes must be continuous and must match the SMPTE 328 timecode of the first presentation frame of each GOP
11. If SMPTE timecode is not present, the material package timecode and the file package timecode in the MXF header metadata must match the GOP start timecode
12. The MXF essence should include a SMPTE ST 385:2012 CP system item and if present, it must be present on every frame and must include a SMPTE 385 user data/time which must start at the material package timecode and must be continuous and monotonic (i.e. NOT reordered)

SOM & EOM

- Metadata for Start of Material (SOM) and End of Material (EOM) per segment per SMPTE ST 377-1:2011

File Name

- The file name shall match the on air traffic I.D.