



**TECHNICAL SPECIFICATIONS
CONTENT DELIVERY FOR BROADCAST**

RELEASED: SEPTEMBER 2017

REVISION HISTORY

Version	Revision Date	Revision Description	Approved By	Notes
1	Sept 1, 2017	First version of new spec released	Director, Broadcast Operations	

TABLE OF CONTENTS

1. HD SPECIFICATIONS FOR BROADCAST	5
2. DIGITAL FILE DELIVERY - HD SPECIFICATIONS FOR BROADCAST.....	6
3. UHD SPECIFICATIONS FOR BROADCAST.....	7
4. DIGITAL FILE DELIVERY - UHD SPECIFICATIONS BROADCAST	8
5. SD SPECIFICATIONS FOR BROADCAST.....	9
6. DIGITAL FILE DELIVERY - SD NTSC SPECIFICATIONS FOR BROADCAST	10
7. ORDER OF EVENTS	11
8. CLOSED CAPTIONING	12
9. CONTACT INFORMATION FOR SPECIALTY BROADCAST	13
10. CONTACT INFORMATION FOR CONVENTIONAL BROADCAST	13
11. FRENCH LANGUAGE AUDIO SPECIFICATIONS – HISTORIA AND SÉRIES+	14
12. HD CAMERAS ACCEPTED FOR BROADCAST	16
13. APPENDICES	18

PURPOSE:

This document describes the video and audio practices and technical standards for the delivery of commissioned original and acquired material to Corus Entertainment for broadcast on Specialty and Conventional networks.

General

The master copy of the program should be recorded directly from Licensor's "master".

All program content should be recorded in accordance with standard industry practices and in accordance with the appropriate ANSI/SMPTE/ITU-R Standards and Recommended Practices.

PLEASE NOTE:

- The technical specifications outlined below are subject to change based on ongoing development.
- Please check with your network executive for delivery requirements prior to delivery.

1. HD SPECIFICATIONS FOR BROADCAST

Resolution:	1920 x 1080i (interlaced)
Frame Rate:	59.94 Hz (29.97 fps)
Chroma Subsampling:	4:2:2
Aspect Ratio:	16:9, 1.78:1
TC Start of Content:	01:00:00;00

SPECIFICATIONS FOR HD AUDIO

Audio reference levels: +4 dBu and/or -20 dBfs, as applicable
Peak levels: range between -18 dBfs and -7 dBfs

Audio levels must be mixed to -24 LKFS as per ATSC A/85 “Establishing and Maintaining Audio Loudness” standard. The official ATSC A/85 document can be found [here](#) (of key importance is section H.6.1 – Long Form Content). For information regarding ITU-R BS.1770-3 “Algorithms to measure audio programme loudness and true-peak audio level” please reference the document [here](#).

Corus will only accept High Definition material delivered with the following general specifications:

- A minimum of two AES/EBU audio channel pairs in a stereo or mono mix; including a clearly outlined audio channel description.
- SMPTE drop frame time code is mandatory for all submitted material. Time code shall adhere to the SMPTE 12M specification, be continuous and synchronous with video.
- All time code references on submitted materials (VITC, LTC) must match exactly.
- Commissioned original content must be captured in HD using an approved camera from the [Corus Acceptable Camera List](#).
- Up-converted SD content is not acceptable. Exceptions will be made for stock footage of historical content.
- Aspect ratio must be noted and the Active Format Description (AFD) descriptor code should be left blank in the file.

2. DIGITAL FILE DELIVERY - HD SPECIFICATIONS FOR BROADCAST

Video	XDCAM HD422 50 Mbps in a MXF wrapper
Bit Rate	50 Mbps
File type	MPEG -2 compression
Resolution	1920 x 1080i (interlaced)
Frame Rate	59.94 Hz (29.97 fps)
Aspect Ratio	16:9, 1.78:1
Timecode	Matching LTC & VITC, continuous, synchronous with video
Time Code Start of Content	TCR 01:00:00;00
Closed Captioning	Scenarist Closed Caption: *.scc file, DF, plus embedded
Audio	Stereo pairs, 48 kHz, 24 bit PCM recorded as:
	Ch 1 = Stereo Left Ch 2 = Stereo Right Ch 3 = Ltotal+DV (if no DV, duplicate Stereo Left) Ch 4 = Rtotal+DV (if no DV, duplicate Stereo Right) Ch 5 = 5.1 Left Ch 6 = 5.1 Right Ch 7 = 5.1 Centre Ch 8 = 5.1 LFE Ch 9 = 5.1 Left Surround Ch 10 = 5.1 Right Surround Ch 11 = Dialogue Ch 12 = Effects

PLEASE NOTE:

- All file delivery must be tested and approved by Corus prior to content delivery. The [Corus File Onboarding Delivery Specifications](#) can be found here.
- All files can be delivered via Signiant, Aspera, or onboarded ad-delivery partner. Alternate delivery methods will need to be determined and agreed to on a case by case basis.
- Global play-out centre in Calgary will also accept content on Blu-ray XDCAM and SxS cards (Blu-ray discs are not accepted)

3. UHD SPECIFICATIONS FOR BROADCAST

Resolution:	3840 x 2160 (progressive)
Frame Rate:	59.94 Hz (29.97 fps)
Chroma Subsampling:	4:2:2
Aspect Ratio:	16:9, 1.78:1
TC Start of Content:	01:00:00;00

SPECIFICATIONS FOR UHD AUDIO

Audio reference levels: +4 dBu and/or -20 dBfs, as applicable
Peak levels: range between -18 dBfs and -7 dBfs

Audio levels must be mixed to -24 LKFS as per ATSC A/85 “Establishing and Maintaining Audio Loudness” standard. The official ATSC A/85 document can be found [here](#) (of key importance is section H.6.1 – Long Form Content). For information regarding ITU-R BS.1770-3 “Algorithms to measure audio programme loudness and true-peak audio level” please reference the document [here](#).

Corus will only accept Ultra High Definition material delivered with the following general specifications:

- A minimum of two AES/EBU audio channel pairs in a stereo or mono mix; including a clearly outlined audio channel description.
- SMPTE drop frame time code is mandatory for all submitted material. Time code shall adhere to the SMPTE 12M specification, be continuous and synchronous with video.
- All time code references on submitted materials (VITC, LTC) must match exactly.
- Commissioned original content must be captured in UHD using an approved camera from the [Corus Acceptable Camera List](#).
- Up-converted content is not acceptable. Exceptions will be made for stock footage of historical content.

4. DIGITAL FILE DELIVERY - UHD SPECIFICATIONS BROADCAST

Video	XAVC 300 Mbps in a MXF wrapper
Bit Rate	300 Mbps
File type	MPEG -4 compression
Resolution	3840 x 2160 (progressive)
Frame Rate	59.94 Hz (29.97 fps)
Aspect Ratio	16:9, 1.78:1
Timecode	Matching LTC & VITC, continuous, synchronous with video
Time Code Start of Content	TCR 01:00:00;00
Closed Captioning	Scenarist Closed Caption: *.scc file, DF, plus embedded
Audio	Stereo pairs, 48 kHz, 24 bit PCM recorded as:
	Ch 1 = Stereo Left Ch 2 = Stereo Right Ch 3 = Ltotal+DV (if no DV, duplicate Stereo Left) Ch 4 = Rtotal+DV (if no DV, duplicate Stereo Right) Ch 5 = 5.1 Left Ch 6 = 5.1 Right Ch 7 = 5.1 Centre Ch 8 = 5.1 LFE Ch 9 = 5.1 Left Surround Ch 10 = 5.1 Right Surround Ch 11 = Dialogue Ch 12 = Effects

PLEASE NOTE:

- All file delivery must be tested and approved by Corus prior to content delivery. The [Corus File Onboarding Delivery Specifications](#) can be found here.
- All files can be delivered via Signiant, Aspera, or onboarded ad-delivery partner. Alternate delivery methods will need to be determined and agreed to on a case by case basis.

5. SD SPECIFICATIONS FOR BROADCAST

Resolution:	720 x 480i (interlaced)
Frame Rate:	29.97 fps
Chroma Subsampling:	4:2:2
Aspect Ratio:	4:3 full frame
TC Start of Content:	01:00:00;00

SPECIFICATIONS FOR SD AUDIO

Audio reference levels: +4 dBu and/or -20 dBfs, as applicable
Peak levels: range between -18 dBfs and -7 dBfs

Audio levels must be mixed to -24 LKFS as per ATSC A/85 “Establishing and Maintaining Audio Loudness” standard. The official ATSC A/85 document can be found [here](#) (of key importance is section H.6.1 – Long Form Content). For information regarding ITU-R BS.1770-3 “Algorithms to measure audio programme loudness and true-peak audio level” please reference the document [here](#).

Corus will only accept Standard Definition material delivered with the following general specifications:

- SMPTE drop frame time code is mandatory for all submitted material. Time code shall adhere to the SMPTE 12M specification, be continuous and synchronous with video.
- All time code references on submitted materials (VITC, LTC) must match exactly.
- Content originally acquired in high definition must not be delivered in standard definition.
- Alternate aspect ratios will be accepted only with prior written consent from Corus.
- Aspect ratio must be noted and the Active Format Description (AFD) descriptor code should be left blank in the file.
- SD content is not encouraged.

6. DIGITAL FILE DELIVERY - SD NTSC SPECIFICATIONS FOR BROADCAST

Video	IMX 30 Mbps in a MXF wrapper
Bitrate	30 Mbps
File Type	MPEG-2 compression
Resolution	720 x 480i (interlaced)
Frame Rate	29.97 fps drop frame
Aspect Ratio	4:3 full frame
Timecode	Matching LTC & VITC, continuous, synchronous with video
Timecode Start of Content	01:00:00;00
Closed Captioning	Scenarist Closed Caption: *.scc file, DF, plus embedded
Audio	Stereo pairs, 48 kHz, 24 bit PCM recorded as:
	Ch 1 = Stereo Left Ch 2 = Stereo Right Ch 3 = Stereo Left + DV (if no DV, duplicate Stereo Left) Ch 4 = Stereo Right + DV (if no DV, duplicate Stereo Right)

PLEASE NOTE:

- All file delivery must be tested and approved by Corus prior to content delivery. The [Corus File Onboarding Delivery Specifications](#) can be found here.
- All files can be delivered via Signiant, Aspera, or onboarded ad-delivery partner. Alternate delivery methods will need to be determined and agreed to on a case by case basis.

7. ORDER OF EVENTS

FILE DELIVERY

All long form program content must be recorded in this exact order:

- 1) A slate lasting one (1) frame and conforming exactly to section SLATE below (ex. 00:59:58;00 - 00:59:58;01)
- 2) One (1) second and twenty-eight (28) frames of coherent black video with silent audio (ex. 00:59:58;01 - 00:59:59;29)
- 3) Program audio and video starts at 01:00:00;00
- 4) The following items are mandatory with delivery of commissioned original programming:
 - a. Minimum ten (10) seconds of black between program segments
 - b. Timing cue sheet
 - c. Commercial blacks (as noted above in part a.)
 - d. Thirty (30) seconds of coherent black video with silent audio following the last frame of program material
 - e. Textless elements
 - f. A minimum of ten (10) seconds of coherent black video with silent audio following textless elements

CONTENT FORMATS

[Corus English Content Formats and Duration Guidelines](#) and [Corus French Content Formats and Duration Guidelines](#) can be found here.

CORUS ENTERTAINMENT END CREDIT/LOGO

Check with your network executive to receive the “Produced in association with” end credit.

SLATE

The visual slate should contain the following information and match the content:

- 1) Title of program/film
- 2) Episode title and number
- 3) Name of postproduction facility
- 4) Date of recording
- 5) Duration of content (excluding blacks)
- 6) Audio channel description

8. CLOSED CAPTIONING

CLOSED CAPTION FILES

For the Specialty Networks: Closed caption files can be provided via email to: Corus-MediaServices@corusent.com

For the Conventional Networks: Closed caption files can be provided via email to: COAS@corusent.com and COACG@corusent.com

CLOSED CAPTIONING (in order of preference):

- 1) Scenarist Closed Caption *.scc file, drop frame plus embedded in video
- 2) Embedded in video
- 3) Delivered as Scenarist Closed Caption *.scc file, drop frame

CAB STYLE GUIDE

- All closed captioning provided to Corus must conform to the [Closed Captioning Standards and Protocol](#).
- All pre-recorded Canadian content needs to be created and encoded using pop-on captions.

HIGH DEFINITION

- If the content supplier is providing closed captions, the embedded closed caption data should conform to EIA-708-B and the captions should be inserted in the VANC space in accordance with SMPTE 436M.
- The Caption Distribution Packet (CDP) will contain the caption service descriptor, EIA-708-B captions and EIA-608 caption data.

PLEASE NOTE:

- HD captions should not have time code embedded within the caption metadata and must have an accurate frame rate matching the final video frame rate provided on the master.
- The closed caption header byte must not be inserted within the first 15 frames of the content.

STANDARD DEFINITION

- English language closed captions should be encoded as closed caption 1 data on line 21, field 1, in accordance with CEA/EIA-608-B and applicable SMPTE standards.
- Additional secondary captions, text and XDS data services can be provided on line 21, field 1 or 2 per CEA/EIA-608-B.

9. CONTACT INFORMATION FOR SPECIALTY BROADCAST

Corus Media Services - Toronto
Corus-MediaServices@corusent.com

Specialty Operations - Toronto
SpecialtyOpsTeam@corusent.com

Mailing Address:
Corus Entertainment Inc.
Attn. Media Services
25 Dockside Drive
Toronto, Ontario
M5A 0B5
Canada
Tel: 416.479.0000

10. CONTACT INFORMATION FOR CONVENTIONAL BROADCAST

Conventional Coordination Group - Calgary
COACG@corusent.com

Conventional On-Air Supervisors - Calgary
COAS@corusent.com

Mailing Address:
Global Television Calgary
Attn. Conventional On-Air Coordination Group
222 23rd Street NE
Calgary Alberta
T2E 7N2

11. FRENCH LANGUAGE AUDIO SPECIFICATIONS – HISTORIA and SÉRIES+

PRODUCTION OF FRENCH LANGUAGE CONTENT

In the case of a French-language production, please clearly identify the language of the program and comply with the technical points above.

ENGLISH LANGUAGE PRODUCTION TO BE DUBBED IN FRENCH

These following sections apply if only an English audio mix is available:

- 1) In the case of an English language document intended for French audio dubbing, the assignment of the audio tracks must be clearly indicated.
- 2) The audio signal must comply with the technical points above.
- 3) To allow maximum flexibility and quality for dubbing, the maximum amount of available separated audio elements is required.
- 4) The audio elements must be at the same frame rate as the delivered video.
- 5) If the number of audio tracks being delivered is greater than the number of audio tracks available on the delivery support, the audio elements must be delivered separately as Broadcast Wave files.

AUDIO ELEMENTS FOR 5.1 CONTENT TO BE DUBBED IN FRENCH

When content is to be dubbed in 5.1 audio, the audio elements can be delivered as Broadcast Wave files or on a HDCAM SR tape.

The delivered audio elements must at least include:

- 1) 5.1 Full Mix
- 2) 5.1 Mix Minus Narration
- 3) 5.1 Stems – BG/Dialogs
- 4) 5.1 Stems – Music & Effects

To allow maximum flexibility and quality for dubbing, the maximum amount of available separated audio elements is required.

Ideally, the mix minus narration should be dipped, but it can be delivered undipped.

AUDIO ELEMENTS FOR STEREO CONTENT TO BE DUBBED IN FRENCH

When content is to be dubbed in stereo audio, the audio elements can be delivered as Broadcast Wave files or on HDCAM SR or HDCAM tape.

The delivered audio elements must at least include:

- 1) Full Stereo Mix
- 2) Stereo Mix Minus Narration
- 3) Stereo Stems – BG/Dialogs
- 4) Stereo Stems – Music & Effects

To allow maximum flexibility and quality for dubbing, the maximum amount of available separated audio elements is required.

Ideally, the mix minus narration should be dipped, but it can be delivered undipped.

PRODUCTIONS THAT REQUIRE DUBBING

For all productions that require dubbing, please provide us with the following elements:

- 1) Final transcript of the original version
- 2) Supers Impression List (A.K.A. "chyrons" or "lower thirds")
- 3) End Credits
- 4) Eps, .psd or .ai format of the logo; if available, animated After Effects project with layers

For questions related to the delivery of these elements please contact:
CorusTVDoublageFrancais@corusent.com

12. HD CAMERAS ACCEPTED FOR BROADCAST

[Corus Acceptable Camera List](#)

BROADCAST CAMCORDERS

Acceptable Minimum Technical Specifications:

- 1) 1920 x 1080, 2/3" CCD sensor, 50 Mbit/s, 4:2:2 Chroma Subsampling
- 2) Supports LTC time code
- 3) Minimum two audio channels

UHD CAMCORDERS

Acceptable Minimum Technical Specifications:

- 1) CCD: sensor 35mm
- 2) Horizontal Resolution: 4096 line
- 3) Dynamic Range: 12 stop
- 4) 12 Bit Depth

STILL CAMERAS and CINEMATOGRAPHY CAMERAS

Acceptable Minimum Requirements:

- 1) 1 inch (25.4 mm) sensor
- 2) 4:2:2 Chroma Subsampling
- 3) 50 Mbit/s

* Should be accompanied by slate for syncing

* Footage should be recorded on external data recorder - See Data Recorder Specs

DATA RECORDERS

Acceptable Minimum Requirements:

- 1) ProRes
- 2) 4:2:2 Chroma Subsampling
- 3) 100 Mbit/s
- 4) Supports LTC time code
- 5) Supports a minimum of two audio inputs

HDV, PROSUMER & MINIATURE FORMATS

- 1) A maximum of 30% of the final acquisition may be from material originating from cameras not meeting the minimum specs of Corus Acceptable Camera list.
- 2) Please contact [Corus Technology – SpecialtyOpsTeam](#) for cameras and data recorders not listed or meeting the minimum requirements. Material not acquired in one of the acceptable formats should be approved prior to the commencement of production.
- 3) Quay Media Services has studios, audio, video and lighting equipment available to assist with productions and all of our acquisition partners. For more information please contact [Production Management](#).

13. APPENDICES

- 1) [Corus File Onboarding Delivery Specifications](#)
- 2) [Corus Commercial Delivery Specifications](#)
- 3) [Corus English Content Formats and Duration Guidelines](#)
- 4) [Corus French Content Formats and Duration Guidelines](#)
- 5) [Corus HD/SD Master File Format](#)
- 6) [Corus UHD Master File Format](#)
- 7) [Corus Acceptable Camera List](#)
- 8) [Closed Captioning Standards and Protocol](#)
- 9) [ATSC A/85 Establishing and Maintaining Audio Loudness](#)
- 10) [ITU-R BS.1770-3 Audio Program Loudness](#)