

APPENDIX: TECHNICAL STANDARDS FTV Broadcasting and Exchange Center

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I. FORMAT OF MEDIA INTENDED FOR BROADCASTING

A. Standards and Norms

The standards and norms of the different signal formats used for the production of programs and their delivery to the France Télévisions group are described in the document ratified jointly by all the French publishers partners of the HD Forum, FICAM and CST under the name:

- [RT 040 - TV - Rec Tech PAD fichier Diffuseurs V1.2-2016](#), for file delivery

In this document as well as the Technical Recommendation PAD Diffusers file, various international standards are mentioned and are subject to change. Readers are encouraged to check regularly that they have an up-to-date version.

An exception specific to the expectations of France Télévisions is indicated in this document and concerns the number of audio channels.

B. Specificity of video image formats

In accordance with the video image formats described in the *Technical Recommendation PAD Broadcaster files*, only HD video formats will be accepted. The technical mode of production (shooting AND post-production) must **exclusively use High Definition standards** (either Super 16 mm or 35 mm film, or an HD electronic format) corresponding to the quality standards of HD broadcasting and this from shooting to making the PAD HD

The incorporation into a program of archive images or images shot under special conditions requiring the use of special equipment which does not correspond to high definition standards, may be accepted if these images are in the minority in the whole of the program.

The images must not have undergone anamorphosis, the original image formats must be kept unless otherwise stated by France Télévisions.

II. HD FILE DELIVERY

A. Electronic delivery

Important Information :

Before the first delivery, the supplier must contact, during office hours, the administrator responsible for the France Télévisions production unit concerned by your programme, who will specify the procedure for electronic delivery.

For each delivery, the supplier receives the EM number of the file to be produced and must enter the metadata in the [Validator Plus](#) interface to release the reserved identifier (ID) of the media.

A program delivered in the form of a file consists, whatever its duration, of a single MXF Op1a file containing the video essence and the associated audio essences. Segmentation markers may be entered in the metadata if the program consists of several parts.

The start of the program (first image and first useful sound) must necessarily start at **Time Code 00:00:00:00**, without the presence of a leader at the start of the file (SOM and TC IN).

The end of the program corresponds to the duration of the program; the end of the file must be in whole seconds with broadcastable image (TC OUT can be lower than EOM)

B. Exceptional case of delivery on physical medium

In the event that the program is delivered on a physical medium, this medium will be delivered under the same conditions and accompanied by information sheets indicating the ID of each program delivered and the EM number.

For safe handling of physical media, it is recommended to use media without moving parts (USB keys, SSD disks, etc. formatted in NTFS or Ex FAT) to the USB 3 standard.

Delivery address :

Delivery from 10 a.m. to 6 p.m. Monday to Friday :

Preparation of the CDE broadcast on the **5th floor CDE**.

Tel : 01 56 22 23 98

In case of emergency (programs scheduled within 24 hours or 72 hours on Sundays and public holidays), contact the Channel Manager present in the FINAL MANAGEMENT on the **5th floor CDE**.

Tel : 01 56 22 47 64 or 54765 (internally).

Note that the CDE does not support the delivery of media called "PRESS": DVD or other, to deposit these media you must contact the administrator responsible for the production unit concerned.

C. File Naming

Each program has a unique Delivery ID that will be communicated after entering the required metadata in [Validator Plus](#).

This identifier consists of 6 alphanumeric characters and can only be used to deliver one version of a program.

Any new delivery must be subject to a new entry of metadata.

Depending on the type of redelivery, the ID will no longer be identical.

- *after a rejection for non-compliance: ID retained*
- *after a refusal following a check: new ID*

This identifier is used to name the following files:

- 123456.mxf (audiovisual file containing images and sounds)

D. File Formats

MXF container format :

MXF Operational Pattern: OP1a norm RDD9

KAG Size : 512

Encapsulation method : Frame Wrapped Essences

MXF encapsulation format

The MXF encapsulation format described in the *Broadcaster File Technical Recommendation PAD* is compatible with the format expected by France Télévisions, although limited to 8 audio tracks.

E. E. Specificity of video formats

Programs must be delivered in high definition (HD)

The video signal, in accordance with the *Technical Recommendation PAD file Broadcasters*, will be encoded with the following characteristics :

- HD Resolution
- Ratio 16/9ème
- 1920 x 1080 square pixels
- Frame frequency : 50 Hz
- Coding MPEG-2 Long GOP, profil 422P@HL, flow of 50 Mbps
- GOP fixed from 12 (N=12, M=3)
- Closed GOP

F. Audio format

An exception to the *Technical Recommendation PAD for Broadcasters*, MXF Ready to Broadcast files may only contain 4, 8 or 16 audio tracks depending on the type and number of audio versions included. Each audio track in the MXF file will carry one monophonic PCM channel, 24-bit resolution, at 48 kHz sample rate.

In this context, **any unused tracks will carry silent channels (encoded silence)**.

The video delivery must be accompanied by a French version in stereo (track 1: left, track 2: right).

In the case of a **mono sound**, it must be **duplicated on both tracks**.

Two other signals can complete this delivery :

- Complete Audio Description (French version mixed with audio description)
- Multilingual version (usually the original version) in stereo

The audio versions, whose signals will prove to be in conformity with the **Technical Recommendation PAD Broadcaster file**, will be placed on the tracks according to the following order :

- Case n°1 delivery of a **French version (VF) only**

The VF will be delivered in stereo format (2.0) mono compatible :

- 1 = left channel
- 2 = right channel
- 3 = **coded silence**
- 4 = **coded silence**

- Case n°2 delivery of a **French version + audio-description (AD)**,
The AD will be in stereo format called "broadcaster mix", where French version and audio description commentary are mixed beforehand and assigned to channels 7 and 8:
 - 1 = left channel (VF)
 - 2 = right channel (VF)
 - 3 = **coded silence**
 - 4 = **coded silence**
 - 5 = **coded silence**
 - 6 = **coded silence**
 - 7 = left channel (AD)
 - 8 = right channel (AD)

- Case n°3 delivery of a **French version + multilingual version (VM)**,
The VM will be in stereo format (2.0) mono compatible, and assigned to channels 9 to 14 :
 - 1 = left channel (VF)
 - 2 = right channel (VF)
 - 3 = **coded silence**
 - 4 = **coded silence**
 - 5 = **coded silence**
 - 6 = **coded silence**
 - 7 = **coded silence**
 - 8 = **coded silence**
 - 9 = left channel (VM)
 - 10 = right channel (VM)
 - 11 = **coded silence**
 - 12 = **coded silence**
 - 13 = **coded silence**
 - 14 = **coded silence**
 - 15 = **coded silence**
 - 16 = **coded silence**

- Case of delivery of a **French version + audio-description (AD) + multilingual version (VM)**,
 - 1 = left channel (VF)
 - 2 = right channel (VF)
 - 3 = **coded silence**
 - 4 = **coded silence**
 - 5 = **coded silence**
 - 6 = **coded silence**
 - 7 = left channel (AD)
 - 8 = right channel (AD)
 - 9 = left channel (VM)
 - 10 = right channel (VM)
 - 11 = **coded silence**
 - 12 = **coded silence**
 - 13 = **coded silence**
 - 14 = **coded silence**
 - 15 = **coded silence**
 - 16 = **coded silence**

Loudness R128

For each version, all the loudness measurements for each pair of tracks must comply with the **R128 standard**.

The following table summarizes the sound **recommendations** for vendors.

	Short programs (< 2 mins)	Long programs (≥2 mins)
Maximum peak level (Max True Peak)	-3 dB TP	-3 dB TP
Target measurement of loudness level over the entire program (Integrated Loudness)	≤ -23 LUFS	-23 LUFS (+/- 1 LU)
Dynamic Excursion (Loudness Range ou LRA)	not measured	≤ 20 LU (+5 LU)
Maximum level of the short-term sound intensity measurement (Max Short Term Loudness)	≤ -20 LUFS	not measured
Dialog short-term loudness excursion range	not measured	average level -23 LUFS à +7 or -7 LUFS

Compliance with the target level of the dialogues must make it possible to feed the linear and non-linear broadcasts of the programs indiscriminately, a multi-screen context leading to an increasing number of listening situations with headphones, or by means of miniature loudspeakers such as those equipping personal computers, tablets and mobile phones.

III. APPENDICES

A. File Formats

MXF container format

MXF Operational Pattern: OP1a Norm RDD9

KAG Size : 512

Encapsulation method : Frame Wrapped Essences

B. Format of essences Video

Format: 1920x1080

Framerate: 25fps

Entrelacement: Interlaced / Upper Field First

Codec Video: Sony XDCAM HD422

Profil: 4:2:2@High

Bitrate: 50Mb/s

GOP Size : 12 ($N \leq 12$ / $M \leq 3$) Fixed or Variable.

GOP Open/Closed : Closed

B-pictures : Yes

C. Format of Audio Essences

Audio codecs : PCM Little Endian 24bit @ 48 kHz

D. Summary of sound recommendations

	Short programs (< 2 mins)	Long programs (≥2 mins)
Maximum peak level (Max True Peak)	-3 dB TP	-3 dB TP
Target measurement of loudness level over the entire program (Integrated Loudness)	≤ -23 LUFS	-23 LUFS (+/- 1 LU)
Dynamic Excursion (Loudness Range ou LRA)	not measured	≤ 20 LU (+5 LU)
Maximum level of the short-term sound intensity measurement (Max Short Term Loudness)	≤ -20 LUFS	not measured
Dialog short-term loudness excursion range	not measured	average level -23 LUFS à +7 or -7 LUFS

