Rai - Radiotelevisione Italiana S.p.A.

TECHNICAL FILE DELIVERY SPECIFICATIONS FOR HD TV COMMERCIALS

SUMMARY

1   Introduction

This document describes the technical specifications for the delivery of audio video files related to advertising content to be broadcast on Rai distribution platforms.

TV commercials must be delivered to Rai only in high definition (HD) according to the formats indicated below.

Rai will systematically submit all TV commercials received to a technical quality check; all commercials that do not meet the technical requirements of sound and image quality specified below will be qualified as non-transmittable and rejected.

All references to international recommendations and regulations (EBU, ITU, ISO) mentioned in this document are related to the most recent public versions of these documents.

The requirements below are essential and mandatory and represent the minimum level required.

2   Glossary

ANCILLARY DATA - auxiliary data carried within the blanking interval provided by video standards

ATC-VITC, ATC-LTC - time code information inserted into the ancillary data of the video signal

EBU - European Broadcasting Union

GAMUT - set of colors that the device or peripheral can produce, reproduce or capture and is a subset of the visible colors (https://it.wikipedia.org/wiki/Gamut).

ISO - International Organization for Standardization

IEC - International Electrotechnical Commission

ITU - International Telecommunication Union

LTC - longitudinal timecode

ProRes® - Encoding technology developed by Apple®

SMPTE - Society of Motion Picture and Television Engineers

SPOT - short television advertising message

VIDEO BUG - small graphic image present on video image

XDCAM® HD422 - recording format introduced by Sony based on MPEG-2

3   Accepted video recording formats

3.1   HDTV Profile MXF/XDCAM HD422 1080i25

The Table summarizes the main characteristics of the *HDTV MXF/XDCAM HD422 1080i25* profile based on the specifications given in SMPTE document RDD9:2013.

HDTV Profile *MXF/XDCAM HD422 1080i25*

MXF Operational Pattern	OP-1a
Essence Container	MPEG ES Mapping, AES-BWF Mapping Generic Essence Multiple Mapping
Video	1920x1080 pixels, 25 frames per second, interlaced scanning, YCbCr, 4:2:2, 8 bit **MPEG-2 Long GOP, 50Mbit/s**
Audio	8 mono PCM channels, 48KHz, 24 bit
Specific regulatory references	
SMPTE RDD 9:2013	MXF Interoperability Specification of Sony MPEG Long GOP Products
ISO/IEC 13818-2	Generic coding of moving pictures and associated audio- Part 2: Video

3.2   Profile HDTV MOV/ProRes422HQ 1080i25

The Table summarizes the main features of the HDTV MOV/ProRes 1080i25 profile based on the Apple ProRes ® compression format.

HDTV MOV/ProRes422HQ 1080i25 Profile

Essence Container	Apple Quicktime
Video	1920x1080 pixels, 25 frames per second, interlaced scanning, upper field, RGB, 4:2:2, 10 bit **Apple ProRes® 422HQ** [1]
Audio	8 mono PCM channels, 48KHz, 24 bit

(1)   https://www.apple.com/final-cut-pro/docs/Apple_ProRes_White_Paper.pdf

NOTE: The acceptance of content in formats other than those specified above will be possible only by a specific agreement with Rai.

4   File delivery of audio/video content

Each spot must be sent at least 4 (four) working days before it is to be aired to allow Rai to perform the control operations. Rai is committed to keep in its systems all commercials received and judged transmittable for one year; if it is deemed necessary to use a commercial spot beyond this date, it must be considered as a new commercial must be and re-sent.

Rai accepts content through the Rai web platform, https://www.tapeless.rai.it/ where any user, upon registration, can:

- o   get a delivery identification code

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- o add a description and other metadata
- o add, if expected, the Auditel tracking code
- o send the video file to be aired.

To use the web platform, please refer to the user manual published on the website www.controllopubblicita.rai.it.

Rai also has an automatic interface reserved to advertising delivery companies, accredited on Rai systems, that operate at national or international level.

5   Image composition

5.1   Safe area for action and titles

Fig. 1 specifies the area of the TV image useful for action ("safe action area"), into which the most important parts of the image should be included, and the area useful for titles ("safe title area").
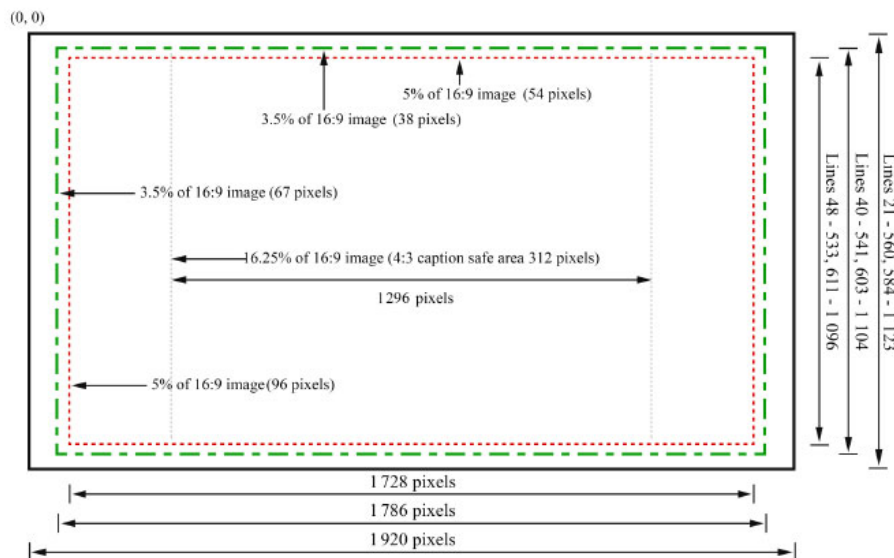
Figure 1

The following areas are highlighted in the figure (Ref. EBU Recommendation R95):

- Green: useful area for action
- Red: useful area for securities

The images of the TV commercials provided must comply with Figure 1.

5.2 Video bugs and channel graphics

During the advertising broadcast, the channel logo and the advertising logo are located in the positions shown in the figure below. Therefore, it is recommended that no writing, video bugs or other elements that overlap with the channel graphics in the positions shown should be present in the advertising content.

Figure 2

5.3 Video vertical blanking interval content

Rai reserves the use of the vertical blanking interval and ancillary data. Therefore, any information inserted in these positions in the delivered files will be deleted from the preparation systems.

5.4 Video levels, gamut errors, and not permitted signals

HDTV signals will be measured according to the ITU-R BT.709 recommendation. Video levels must fall within specific limits so that the program can be used without further processing.

Any signal outside the specified limits is considered as gamut error. Using traditional representations where the nominal black level is represented at 0 mV (or 0%) and the nominal white level is represented at 700 mV (or 100%) requires that the RGB components comply with EBU recommendation R 103, i.e.:

- R, G, and B components fall between -35 mV and 735 mV (-5% and 105%, respectively)
- Luma component (Y) falls between -7 mV and 721 mV (-1% and 103%, respectively)

Considering the difficulty in controlling transients, a margin of error quantified as 1% of the number of pixels is allowed. Only video frames having more than 1% of the pixels outside the specified limits will be considered as gamut errors.

6 Audio signal requirements

6.1 Assignment of audio channels

All commercials must be delivered with stereo soundtrack.

The number of audio channels must meet the requirements of the video standard (see section 3).

The first two must contain the stereo soundtrack; subsequent audios must be composed as follows:

- In case of clips declared as "audio-described."
    - 7,8 audio tracks shall contain audio description soundtrack;
    - all other audio tracks present must contain audio silence.
- In the case of clips declared as "not audio-described"
    - All tracks after the first two must contain audio silence.

Note: In the creativity of the audio description, care should be taken not to include the narrator's voice in the first two seconds of the clip.

6.2 Loudness

The audio of the commercials (pairs 1,2 and if present 7,8) shall be normalized using the measurement methodologies provided for by the current EBU recommendations.

Specifically, it is required that *Program Loudness Level, Maximum Short Term Loudness* and *Maximum True Peak Level* measurements are made on the audio signal, and that these measurements comply with the values shown in the following table:

Program Loudness Level	**-23.0 LUFS ±0.2 LU**
Maximum Short Term Loudness	**-18.0 LUFS ±0.2 LU**
Maximum True Peak Level	**-2.0 dBTP ± 0.3 dBTP**

These measures are defined in the EBU R128, EBU R128s1, ITU-R BS.1770 recommendations and in the EBU Tech 3341.

The Program Loudness Level measurement must refer to the entire duration of the commercial from the first video frame excluding the technical head and tail signals.

7   Quality requirements

Rai carries out a quality check at the stage of accepting audio/video files, which covers both image and sound and requires that they have "excellent" quality i.e. grade 5 on the evaluation scale of the ITU-BT 500-14 Recommendation.

7.1   ANTI-PSE

Flashes of light, intermittent lights and certain types of repetitive visual patterns can cause problems for viewers with photosensitive epilepsy (PSE). Television is, by its very nature, an intermittent light source and therefore it is not possible to completely eliminate the risk of causing seizures in subjects suffering from this form of epilepsy; however, some precautions are possible to reduce the risk, especially when free and unnecessary. It is advisable to consult the website of the Independent Television Commission (www.ofcom.org.uk) for some basic guidelines on this issue.

8   Packaging of video/audio files

8.1   Content of the video file

Each video file must contain only one commercial.

8.2   Start and end tails – delivery the material by web portal

Each video file must must include the appropriate start and end tails.
The contents of the start and end tails are summarized in Table 1.

Table 1

Program section	Duration (sec)	Video	Audio
Identification tail	5" (minimum)	Visual identification program	Aural identification or silence
Starting tail	3"	Black	Silence
Program	Duration of the program	Program video	Audio of the program
Tail end	3" (minimum)	Black	Silence

Note that the longitudinal time code track should preferentially mark 10:00:00:00 at the beginning of the commercial (first serviceable video frame) and in any case must be continuous and uninterrupted.
The black and audio silence of the tails are used by Rai to trim the clip with 5 (five) frames of black necessary for the separation between the individual commercials on air.

9 Standards, Recommendations and Technical Regulations

Reference	Title
ITU-R BT.500	Methodology for the subjective assessment of the quality of television pictures
ITU-R BT.1702	Guidance for the reduction of photosensitive epileptic seizures caused by television
ITU-R BS.1770	Algorithms to measure audio program loudness and true-peak audio level
ITU-R BT.709-6	Parameter values for the HDTV standards for production and international program exchange
EBU R95	Safe Areas for 16:9 Television Production
EBU R128	loudness normalization and permitted maximum level of audio signals
EBU R128 s1	Loudness parameters for short-form content (adverts, promos, etc)
EBU Tech. 3341	Loudness metering: Ebu mode metering to supplement EBU R128 Loudness normalization