TECHNICAL PERFORMANCE GUIDE FOR THE SUPPLY OF 16:9 FORMAT TV COMMERCIALS

TECHNICAL SPECIFICATIONS

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1 INTRODUCTION

As of 01.11.2009, TV commercials (hereinafter referred to as programmes, too) shall be delivered to Rai Trade in 16:9 format only.
This document includes technical and quality specifications for the delivery of commercials in 16:9 format Standard Definition (SD), ready to be broadcast.
Rai Trade will systematically control all TV commercials received. Its specifically trained staff will check the quality of commercials by means of special equipment, and will refuse any commercials not meeting the technical specifications or quality requirements of sound and image, described in these technical specifications.
All references to international regulations and recommendations (EBU, ITU, ISO) mentioned in this document are to be understood as relating to the public versions of the documents above.

2 ACCEPTED VIDEO RECORDING FORMATS

Rai Trade accepts TV commercials with image ratio 16:9 in the following recording format only:

* SMPTE D10, 50 Mbit/sec, 625 lines, 50 fields/s with Longitudinal Time Code (LTC)[1].

Commercials can be supplied through:

* magnetic tape ½" IMX;
* rewritable optical disk 120 mm "Professional Disc" XDCam;
* in the shape of MXF video/audio file.

The MXF file must be in the OP1A format with video coding SMPTE D10 50Mb/s.

As an exception, the supply of commercials on magnetic tape Digital Betacam and Analogic BetaSp is also accepted.

Video recordings in consumer formats such as miniDV, DVCPro, VHS, DVD, U-matic and video files of non-professional formats are accepted just for viewing purpose.

The programmes supplied to Rai Trade shall be second-generation recordings at the most, with respect to the master. The supply of recordings of successive generations is allowed only if processed in a fully digital way, without algorithms of numeric compression, and without switching from analog to digital signals and vice versa.

The quality characteristics required for recordings are specified in Section 6 “Quality Requirements”, which you are kindly requested to consult.

[1] The SMPTE D10 format records video signals 625/50 at components YUV 4:2:2 in numeric form, as well as numeric audio signals in compliance with relevant international regulations (Ref. SMPTE 356M-2001, “Type D-10 Stream Specifications – MPEG-2 4:2:2P @ ML for 525/60 and 625/50”). An algorithm of numeric compression complying with standard MPEG2 4:2:2P @ ML “I-Frame only” at 50 Mbit/s is applied for video signal.

2.1 RECORDINGS 525 LINES, 60 FIELDS/S

Since Rai Trade accepts just TV commercials with recording signals with 625 lines 50 fields/s, if the native material is in format 525/60, the standard conversion shall be made by the supplier by means of converters provided with motion compensation. Rai Trade will not accept video commercials converted from 525/60 into 625/50 by means of a standard converter with simple field interpolation.

3 TECHNICAL MATERIAL SENDING

Every commercial shall possibly be sent 10 days before broadcasting beginning.

For every commercial relating to one product, 2 media shall be sent (just in case of material medium).

As for MXF files, the file can be sent through the RAI TRADE receiving platform (download operating manual).

They can be used during the year. In case the same commercial is re-used in the second year, media will have to be replaced.

Media shall include some information, as specified in paragraph 7.3.

Goods to be sent carriage free to:

Rai Trade – Via U. Novaro, 18 – 00195 Rome

Programming Office: Tel. 06-33178401 / 78403

4 IMAGE COMPOSITION

4.1 IMAGE RATIO 16:9

Supplied video media shall include commercials produced with image format 16:9 FHA (Full Height Anamorphic), and shall be recorded in compliance with format 16:9 (Ref. ITU-R BT.601-6).

If a commercial in format 4:3 is delivered, Rai Trade will reserve the faculty to convert it into format 16:9, adding black lateral bars (so called pillarbox effect).

4.2 SAFE AREA FOR ACTION AND TITLES

Figure 1 specifies safe action area for TV images, which will include the most important parts of the image, as well as the safe title area.

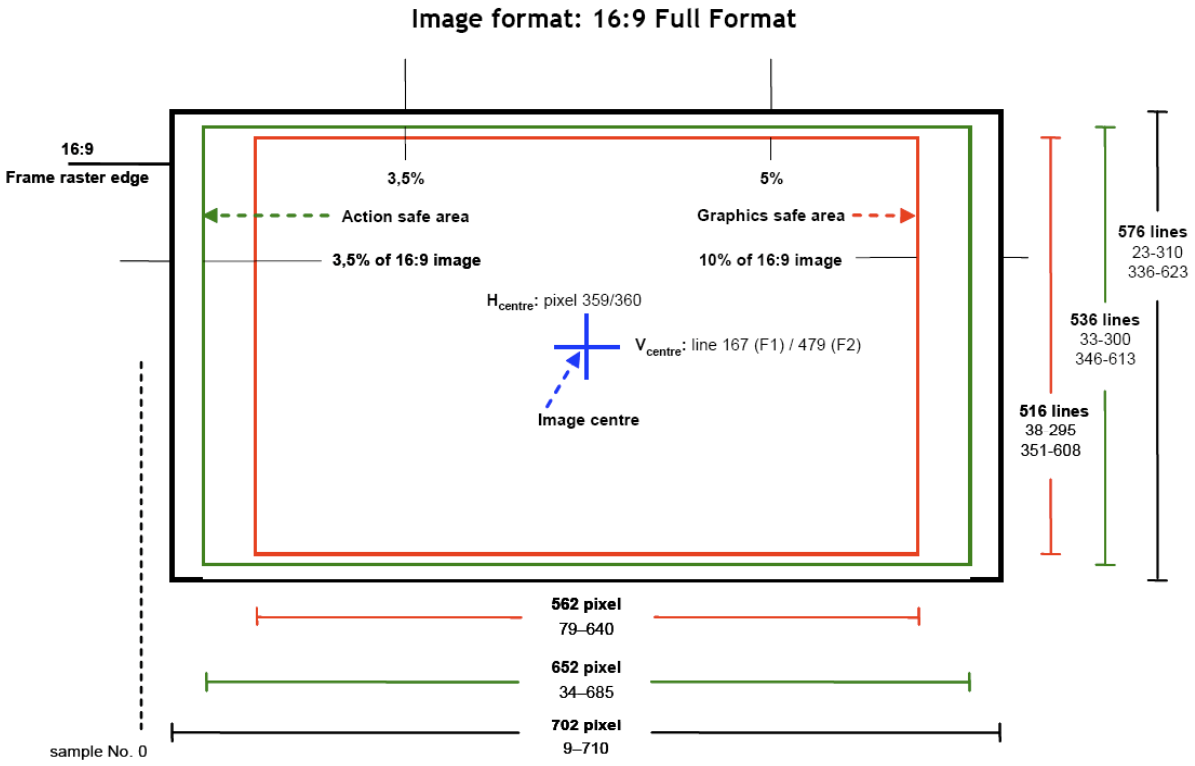


Figure 1

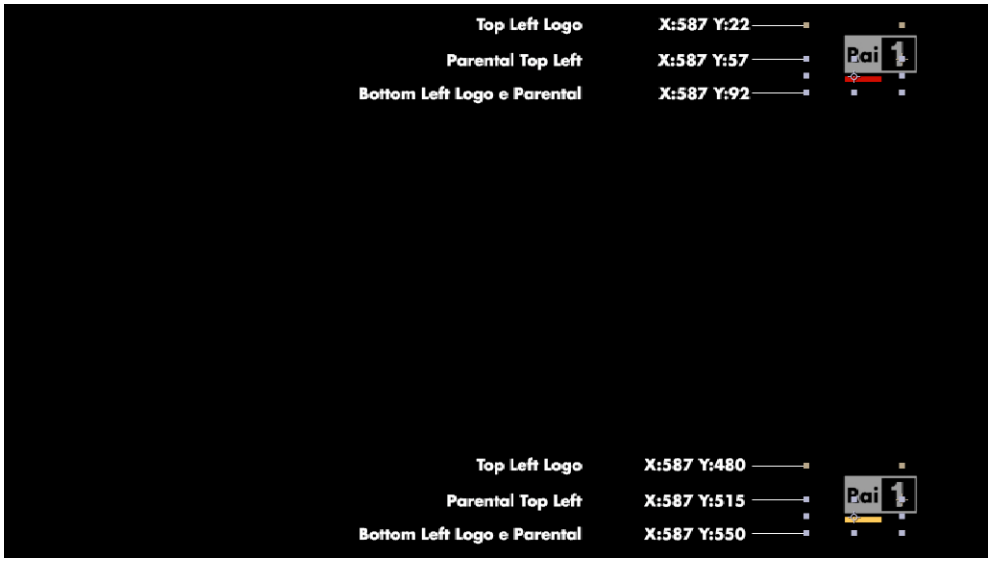
The linear size of the safe action area (green rectangle) is reduced by 7% vertically, with respect to the size of the TV image, and the size of the safe title area (red rectangle) is reduced by 10% vertically and 20% horizontally (ref. Recommendation EBU R95).

The images of supplied TV commercials should comply with Figure 1.

The following table summarises what has been described above:

	HORIZONTAL			VERTICAL		
	%	*No. of pixels*	*Pixel numbers*	*%*	*No. of lines*	*Line numbers*
Production aperture	103	720	0-719	100	576	23-310 & 336 - 623
Frame raster edge	100	702	9-710	100	576	23-310 & 336 - 623
Clean aperture	100	702	9-710	99	573	24-310 & 337 - 622
Action safe area	93	652	34-685	93	536	33-300 & 346 - 613
Graphics safe area	80	562	79-640	90	516	38-295 & 351 - 608

Keep in mind that during the broadcasting of a commercial, the channel logo is usually located in the image portion to the top right for the all channels. Fig. 2



4.3 CONTENTS OF VERTICAL BLANKING

The vertical blanking interval can be used for entering data such as Televideo.

RAI reserves the right to use the vertical blanking interval for these purposes; unless otherwise agreed, it does not accept supplied video media with vertical blanking intervals including insertion signals such as Video Index and WSS (Wide Screen Signalling). Any time code included in the vertical blanking interval (VITC) shall coincide with the Longitudinal Time Code (LTC), so as to be blanked with no problems.

5. RECORDED AUDIO SIGNAL CHARACTERISTICS

5.1 PROGRAMME AUDIO LEVEL ADJUSTMENT

In order to obtain correct recording levels in the material medium, the videotape recorder alignment procedure must be carried out by means of the standard medium supplied by the producer.

The levels are defined in document ITU-R BS.1726. The alignment level (reference) shall be -18 dBFS (EBU Rec. R68 - PPM 4 on an instrument BBC PPM -IEC type IIa).

Alignment tones are used to identify several channels and to point out that, with no adjustment, the programme respects imposed limits and will be broadcast as the producer wants.

The tones must be at Alignment Level (AL) equalling -18 dB FS (EBU Rec. R68 - PPM4 on an instrument PPM BBC - IEC type IIa), with tolerance span not higher than +/- 0.1 dB.

The Permitted Maximum Level (PML) for audio signals, in compliance with ITU-R BS.645-2, shall comply with regulations ITU-R BR.1384-1 and ITU-R BS.1726. Signal peaks shall not exceed -9 dBFS if measured with a quasi-peak programme meter (IEC 60268-10).

As suggested in ITU-R BS.1726, a digital audio programme created in a system with alignment level equalling -20 dBFS can be exchanged and used with no need to change the overall level. However, the programme supplier shall take care to change the level of alignment tones. The supplier will also check that the highest PML level is always within the above-mentioned limit for the whole length of the programme.

5.2 LOUDNESS

The commercial loudness value shall be measured in agreement with the method pointed out in resolution AGCOM 219/09/CSP of 05/01/2010.

In particular, the average loudness level of the single spot shall be measured on the basis of the algorithm under points 4 and 5 of attachment A of the resolution above.

The average level required is 24 LKFS ± 0.5 dB.

If the value of the average loudness of the delivered programme is different, Rai Trade reserves the right to standardise the average loudness level without changing the audio trend.

These instructions are subject to be reviewed in the future; any reviews shall be included in a later version of this document.

5.3 AUDIO TRACK ASSIGNMENT

All commercials shall be delivered with two audio tracks.

Media with linear audio coding (PCM) at 16, 20 or 24 bits are accepted. Depending on the medium or the type of coding set, the number of audio channels can change from minimum 4 audio channels to maximum 16 audio channels (in the case of video/audio files).

Independently of the kind of medium used:

* in case of monophonic audio, it is recorded on track 1 and identically repeated on track 2, perfectly aligned; all other tracks are dumb;
* in case of stereophonic audio, track 1 includes the whole sound of the left channel, and track 2 the whole sound of the right channel; all the other tracks are dumb.

6 QUALITY REQUIREMENTS

As pointed out in Section 1, Rai Trade controls quality at the time of programme acceptance; this control concerns both image and sound, whose qualities must be very good, that is, equalling 5 in the evaluation scale of Recommendation ITU-BT 500.

The material medium shall be intact (without scratches, breaks or mechanical defects).

The material medium shall be exempt from any imperfections which might cause a perception defect in the audio/video contents.

6.1 ANTI-PSE

Flashes, intermittent lights and some kinds of repetitive visual patterns can cause problems to viewers suffering from photosensitive epilepsy (PSE). For its own nature, television is an intermittent source of light, and thus, it is not possible to eliminate completely the risk of causing convulsions to people suffering from such kind of epilepsy; however, a few precautions are possible to reduce their risk, above all, whenever the risk is gratuitous or unnecessary. It is recommended to consult the website of the English Independent Television Commission www.ofcom.org.uk for some fundamental guidelines about this problem.

6.2 TAPE RECORDER ALIGNMENT

The recording of the video signal on the tape shall be carried out in compliance with the specifications of the recording format. The alignment of a video recorder with such specifications shall be checked by using standard tape.

The alignment procedure for the videotape recorder includes the following steps:

1. playing the standard tape;
2. perfectly align the playing chain of the recorder on it;
3. recording a tape with signals similar to that of the standard tape;
4. playing the recorded tape;
5. making sure the signals thus played agree with the signals played by the standard tape;
6. otherwise review recording chain alignment;
7. repeating the procedure from step 3 until condition 5 takes place.

7 VIDEO MEDIUM PACKAGING

7.1 VIDEO MEDIUM CONTENTS

Each video medium shall contain just one commercial.

7.2 INITIAL AND ENDING QUEUES

Each medium shall include adequate initial and ending queues.
Contents of initial and ending queues summarised in table 1.

TABLE 1

Contents of initial and ending queues of video media

Programme section	Length (sec.)	Video	Audio
Protection queue *	10" (minimum)	not recorded	not recorded
Alignment queue	60" (minimum)	75% EBU colour bars	1 kHz at reference level
Identification queue	15" (maximum)	Visual identification of the programme	Sound identification or silence
Starting queue	10"	Countdown with the last 2 sec. in black	Silence
programme	**programme length**	**programme video**	**programme audio**
ending queue	30" (minimum)	black	silence

* The Protection queue refers just to tape programmes

Remember that:

* the video signal recorded in the alignment queue shall be a signal of 75% colour bars;

* as to monophonic programmes, the audio signal recorded in the alignment queue shall be a continuous note of 1000 Hz at reference level;
* as to stereophonic programmes, the audio signal recorded in the track of the alignment queue carrying the left channel must be a note of 1000 Hz at reference level, interrupted by half a second of silence every 3 seconds; on the other hand, the audio signal recorded in the track carrying the right channel must be a continuous note of 1000 Hz at reference level, whose phase shall comply with the one of the left channel;
* the last 2" of the countdown on the starting queue shall include black and silence;
* The Longitudinal Time Coding shall be 10:00:00:00 at the beginning of the programme.

Black colour and silence both at the beginning and ending of each commercial is necessary for editing breaks with 10 silence and black frames as separation between single commercials.

The signals recorded in the video medium shall have no discontinuities along the whole recording, including initial and ending queues.

In case of MXF file forwarding, with the aim of reducing file size, it is alternatively possible to follow this programme composition:

Programme section	Length (sec.)	Video	Audio
Identification queue	5" (minimum)	Visual identification of the programme	Sound identification or silence
Starting queue	3"	black	silence
Programme	**programme length**	**programme video**	**programme audio**
ending queue	3" (minimum)	black	silence

7.3 CONSIGNMENT PAPERS

Each medium shall go together with the information which is necessary for its identification. In particular, each medium shall be provided with a label (located in the space assigned to it) which shall include:

* Generic description of the subject
* Product name
* Subject name
* Producer
* Customer
* Broadcasting instructions
* Total commercial length
* Aspect format
* Scheduled programming date (optional)

The same information shall be present in the label on the medium case (holder).

Moreover, paper specifications shall also be attached. Apart from the above-mentioned information, those specifications shall include:

* Timecode of the first useful frame of the programme
* Presence of lower-quality material for precise editorial needs
* Loudness value (see paragraph 5.2)
* Special notes for the correct broadcasting of the film

In case of material sent in the shape of a file, as to consignment papers, follow the instructions in the manual which you can download at www.raitrade.it, advertising/service section.

8 INTERNATIONAL REGULATIONS

ITU-R BT.601-6 - format SDTV 16:9

SMPTE 356M-2001 - format IMX - D-10

ITU-R BS.1726 – alignment level

EBU R68 - audio alignment level

EBU R95 – image format

EBU R48 – audio track allocation

ITU-R BT 500 - TV image quality subjective evaluation

ITU-R BS 1770 - loudness measurement

ITU-R BS 1771 - requirements for loudness and true-peak meters