Technical requirements

for commercials material delivered to ITV

CONTENTS

This note of the Technical Requirements for Commercial material commissioned by ITV is intended to give guidance to producers and their technical support staff and to assist them in ensuring that they are able to deliver commercials that meet ITV's requirements.

This note is based on the regulatory technical requirements imposed on ITV plc. within the terms of its licenses from OFCOM and will also include standards and practices that are established within these companies.

Advances in production techniques and changes in operational requirements will necessitate review of its content from time to time.

James Robinson

Senior Manager, Technology Planning & Development

ITV plc

Commercial Delivery Requirements Summary

Commercials must conform to ITV's Technical Guidelines set out in sections 2 & 4 of this document

- Delivery tape format: Digital Betacam.
- The first 12 frames of the commercial must be mute.
- The last 12 frames of the commercial must have no key audio e.g. voiceover. Background audio is acceptable.
- The aspect ratio of the commercial must be 16:9 full height.
- Graphics safe area for 16:9 full height material must conform to the EBU R95-2000 - 16:9 shoot and protect 14:9 for safe action and graphics.
- Audio on tracks 1 and 2 must be mixed for transmission.
- Audio on tracks 3 and 4 must either be a replica of tracks 1 and 2 or mute.
- Vertical Interval Timecode must be on Lines 19,21,332 and 334
- Text height for a 16:9 Full Height master must be at least 16 lines.

Format of Commercial unique identifier (CUI):

The CUI must conform to the following standard in the example below:

CHARACTERS	**CODE**	**EXAMPLE**
3 Upper case letters (A-Z)	Agency	JWT
1 solidus character(/)	Separator	/
2 upper case letters (A-Z)	Client	BC
2 upper case letters (A-Z)	Product	SL
3 Numbers (0-9)	Commercial item	038
1 solidus character (/)	Separator	/
3 Numbers (0-9)	Duration of transmission in seconds	030

The CUI example given above would be set out as follows:

JWT/BCSL038/030

1. Technical Requirements For Commercials delivered to ITV

INTRODUCTION

Under the Communications Act 2003, OFCOM is charged with maintaining high technical standards throughout the Independent Television system. The responsibility for the maintenance of standards is delegated to the licensee who is answerable to OFCOM. The following stipulates the technical quality standards required by ITV to achieve these requirements.

1.1 Technical Quality

Prior to acceptance, all commercials will be technically assessed to ensure that it meets the ITV companies' delivery requirements and will be graded using the ITU-R five-point quality scale as shown below:-

Quality Grade	Assessment
5	Excellent
4	Good
3	Fair
2	Poor
1	Bad

ITV licensees are required by their licence to transmit material conforming to the following guidelines:-

(a) Live material should achieve a sound and vision grade of 5.

(b) Recorded material should achieve a sound and vision grade of 4.

1.2 Technical Contacts

ITV plc has more than one delivery point. Please see section 4.7 for these details. For any other issues please contact the following:

ITV Technology (for guidelines issues):
James Robinson
Senior Manager
Technology Planning & Development
ITV
200 Grays Inn Road
London, WC1X 8HF
Tel: 084488 14704
Email:james.robinson@itv.com

ITV Transmission (for operational issues)
Ian Gill
Transmission Content Manager
The Southern Transmission Centre
The London Television Centre
Upper Ground,
London, SE1 9LT
Tel: 020 7849 7821
Email: ian.gill@itv.com

2 PRODUCTION STANDARDS

Except when specific agreement has been obtained in advance from the ITV technical contact, all commercial material produced for ITV must be originated and post-produced on equipment compatible with the 625-line PAL system I and which meets the performance specifications as laid down in the 'OFCOM Handbook of Technical Standards for Television Production' as well as specific requirements contained within this delivery document. Documentary evidence of proof of performance may be required.

2.1 Vision Quality

Pictures must be of the appropriate quality for television transmission, attaining at least grade 4 on the ITU-R 5 point scale.

The vision modulation levels should use the full video signal range and should be free of black crushing or highlight compression and be consistent throughout the programme. Resolution of fine detail in low-luminance areas of the picture should be maintained. The insertion of black lift to improve details near black level is not acceptable.

Transient response should be such that ringing, smear and echoes are not noticeable. Moiré and other patterning should not be visible under any circumstances. You should be aware of Moiré patterning that may not have been visible if component monitoring has been used in the production process but may be visible in PAL. Particular attention must be given to the preservation of colour balance and the rendition of skin tones.

Lighting conditions during production should be appropriate to television and allowance must be made for the differences in reproduced contrast ratios of television and theatrical displays.

No luminance going below blanking level is acceptable.

Transcoding between component and composite video or digital to analogue and analogue to digital should normally be limited to one codec pair.

Particular care must be taken to avoid illegal colours when using caption generators, graphics equipment and video clippers, etc. This can be achieved by adhering to EBU recommendation R103-2000.

It is not possible to assess the legality of video components directly from a waveform monitor displaying YUV signals. This measurement must be undertaken in RGB form, preferably using a broadcast standard lightning, diamond or RGB parade display.

Compared with the recorded colour bar line up signal:
* R, G and B signals must lie in the range -5% to +105%, and
* The resultant luminance signal must lie in the range -1% to +103%.

For more information see EBU recommendation R103-2000.
http://www.ebu.ch/CMSimages/en/tec_text_r103-2000_tcm6-4677.pdf

2.2 Video Compression

Video compression during the production process should only be used after prior approval, which should be sought via the relevant ITV company. Where a particular system and compression ratio has been approved the production path should be organised to limit any noticeable effect on the resulting quality of the final edited version. Any compression greater than 2:1 must be clearly shown on the recording report, indicating the system used and the compression ratio. This information must be carried forward to the edited master showing it

contains material that has been previously compressed. When transmitted as part of the D3/4 Multiplex and the Sky Digital platform the programmes will be compressed to lower bit rates, which should be born in mind.

Mini DV, DVCAM and Hi8 are considered non-professional formats for commercial making. Permission must be sought from an ITV Technology contact before shooting on these formats.

The HDV format can be used in standard definition mode to good effect, however it is still considered to be a non-professional format and should be treated in the same way as DVCAM.

Using a DVD as insert material into a commercial is not acceptable. If you have problems sourcing suitable quality inserts, please contact the ITV technical contact for advice.

Line 23 Signalling:
Some of these formats above insert a line 23 signal onto the tape. This signal must not be present on the final edited master tape for transmission.

2.3 Vision & Special Effects

The use of some special effects may conflict with engineering requirements. We would ask that Special Effects processes be discussed before they are committed to the commercial. Examples of this are: “Film Effect” (field doubling) or the reduction of resolution by the use of filters or electronic effects. It is good practice to produce a high quality master (without effects) so that substitutions/alterations can be made easily. In all cases it is suggested that approval must be sought via your relevant Technology contact.

2.3a Flashing Images and Repetitive Patterns

Flickering or intermittent lights and certain types of repetitive visual patterns can cause problems for some viewers who have photosensitive epilepsy. The television companies, together with OFCOM, have consulted with leading medical opinion in this area to draw up guidelines aimed at reducing the risk of exposure to potentially harmful stimuli. For further notes see Appendix 3.

2.4 Widescreen Aspect Ratios

All commercials should be delivered in 16:9 Full height aspect ratio, shot and protected for 14:9

Commercials should be framed for 14:9 safe action and graphics that meet the specification set by the EBU. This will allow for the commercial to be utilised in most transmission markets.
Transmission of widescreen commercials will be from the 16:9 full height master. This tape can also be used to derive any 14:9 (slight letterbox) or 4:3 master if required through the use of an aspect ratio converter. It is also essential that the clock is in the same aspect ratio as the commercial and should be idented with 16:9 FH. This is necessary for easy identification purposes.

The recording report, tape shell, case and clocks should all be clearly marked with the aspect ratio.

The shooting of 16:9 full height widescreen on a 4:3 CCD is discouraged. Please seek advice from the ITV Technology contact.

Some cameras insert Line 23 widescreen data onto tape. This data must not be on the final edited transmission master delivered to the broadcaster.

2.5 Sound Quality

The audio signal shall have a tonal balance that is correct in the context of the commercial and should be free of noticeable noise or spurious signals such as hum, distortion, sibilance, wow and flutter and acoustically produced interference.

Stereo commercials must have correct left/right spatial relationship. Left and right channels should also have the correct phase relationship throughout the commercial including line-up tone.

All recordings using microphones should use appropriate techniques and particular care should be taken with phasing when using multiple microphones. The placing of microphones should minimise the pick up of extraneous background noise. Care should be taken with personal microphones to minimise rustle from clothing.

Care must be taken on studio recordings that talkback is not recorded on tape either through acoustic or electronic pickup.

The dynamic range of commercial sound must not be excessive and should be suitable for the television medium. When mixing audio, care should be taken to give a correct balance between music & effects and the programme dialogue as well as making sure that the mix is acceptable using mono TV speakers. For guidance, an example of typically suitable sound levels are included in Appendix 4.
In general, all compressed commercial material delivered to ITV should not exceed 4 on a PPM.

While the use of volume compression may be appropriate for some types of commercials, it should be used only with extreme care.

2.6 Tape Formats - Acquisition and Post Production

During the acquisition and post production stages we would expect producers to be seeking to maximise benefits from modern technology. This would mean entering the digital domain as soon as possible; this could be by acquiring on broadcast quality digital formats or editing to a digital tape format and ensuring that any post production applied thereafter was as transparent as possible. Transcoding between component and composite video should normally be limited to one codec pair. Documentary evidence of proof of performance may be required.

If analogue component or analogue composite tape is used as the acquisition and/or post production format, the maximum number of generations must normally be limited to 2 before delivery.

Other tape formats for acquisition, including formats not normally considered as broadcast quality, may be acceptable but only after prior approval, which must be sought from the ITV Transmission contact on page 4 of this document.

For DELIVERY REQUIREMENTS see Section 4.

2.7 Subtitles

Commercials may be delivered with teletext subtitles to assist the hearing impaired. The subtitle/caption information may be recorded as text data conforming to World System Teletext with subtitles on page 888, recorded on TV line 335 in field blanking on the video tape.

Subtitles must be produced in accordance with the OFCOM document ‘Guidance on Standards for Subtitling’.
For more information please visit their website: www.ofcom.org.uk

2.8 Commercials Produced on Film

There should be sufficient lighting for the stock used. If not, unacceptable changes in grain and picture quality may occur when the commercial is edited. On some newer stock overexposure may cause increase in grain and tests should be made to establish the normal range for the stock to be used.

All film must be telecine transferred at 25 frames/second.

Low contrast stock must be used for television prints.

Location sound must be recorded using equipment and techniques capable of producing sound quality commensurate with the quality achieved by the Nicam and digital stereo transmission systems. The use of timecode locking techniques is preferred to pilot-tone.

2.8a Film to Tape Transfer

Film must be transferred using flying spot or CCD telecine at 25 frames/second.

The use of "varispeed" to modify running times is not permitted.

Film must not be transferred via standards conversion.

Particular attention must be given to the preservation of colour balance and the resolution of fine detail in low-luminance areas of the picture. Black crushing is to be avoided and the insertion of black lift to improve details near black level is not acceptable.

2.9 Standards Conversion

Standards Converters shall be high quality and employ motion interpolation to reduce movement judder and loss of resolution.

2.10 Running Time

The broadcaster will run the commercial for the booked duration. The duration of any key audio tracks of the commercial must be less than that of the pictures by at least one second. The key audio must start not earlier than 12 frames after picture start and finishing no later than 12 frames before the end of pictures. This condition applies irrespective of the booked duration of the commercial and ensures that the complete key audio is transmitted.
At the end of the commercial, the last frame of picture must be frame frozen for a further 10 seconds.

2.11 High Definition Television

Due to the number of formats available to shoot HDTV pictures, it is recommended that you contact the ITV Technology contact (as per section 1.2) to discuss which format is best for your commercial.

For producers wishing to acquire using an HD format and down-convert to SD, please discuss this with an ITV technology contact. All finished commercial material must comply with the SD delivery requirements.

3 MONITORING CONDITIONS

3.1 Video

It is important that control rooms and viewing rooms used to assess commercials quality during post-production, recording and telecine transfers do not affect subjective impressions of the luminance, resolution and colour attributes of the picture. It is important therefore that the viewing conditions should closely correspond to ITU-R Recommendation BT500 (CCIR Rec. 500).

It is particularly important that picture monitor's are set up to a peak output of 90 Cd/m^2 and brightness should be adjusted (under the ambient lighting conditions that will be used for viewing) using a picture line-up signal with ± 14mV pedestal step.

Productions should be checked on PAL composite monitoring to ensure compatibility with PAL transmission standards.

3.2 Audio

Assessment of sound quality should be carried out in controlled listening conditions. Parameters requiring critical appraisal are volume, loudness, balance, stereophonic image, and the compatibility and intelligibility of the audio mix for the listener's of Dolby Surround (if encoded), Nicam and monophonic receivers.

EBU publication 'TECH. 3276-E' recommends technical standards that should be adopted for the acoustic properties of control and listening rooms.

4 DELIVERY REQUIREMENTS

ITV requires its standard definition recorded commercials to be delivered on Digital Betacam videotape. The tape supplied must be the final edited master tape.

The cassettes supplied must be of the highest professional quality and contain first pass tape and of a type appropriate to the format used, otherwise malfunction of equipment may occur or poor technical quality may result. Inter-machine alignment tests may be required.

Tapes must be in the manufacturers cases and should be protected by suitable packaging material, and they must be clearly labelled.

Note: Flock filled padded envelopes are not suitable since a failure in the packaging can lead to contamination of the tape.

4.1 VTR Leaders

Immediately prior to the start of the commercial an alignment/identification leader is required. Please see *Appendix 1* for further details.

4.2 Video Signal

The recorded video signal shall be compatible with the 'Specification of Television Standards for 625-line PAL System I Transmissions in the United Kingdom' published by the United Kingdom Department of Trade and Industry. The video signal must be accurately related to the line-up signal recorded at the head of the tape. The Active Picture boundaries (horizontal and vertical) must have constant timing and not be less than the specified blanking tolerance. See *Appendix 6* for more detail.

4.3 Audio Signals

The recorded audio level must be related accurately to the line-up tones recorded at the head of the tape. Peak programme levels must not exceed line-up levels by more than 8dB. The sound shall be recorded on the two designated tracks. All tracks must be suitably mixed for television transmission. Separate dialogue and M & E tracks are NOT acceptable on Audio tracks 1 and 2. The first and last 12 frames of the commercial should not contain any key audio e.g. voiceovers. Background music is acceptable.

4.4 Sound/Vision Synchronisation

Under no circumstances may audio and video be out of synchronisation by any noticeable amount i.e. audio leading vision by no more than one field and lagging vision by no more than two fields The use of dialogue replacement should not produce any such effects.

4.5 EBU Timecode

Timecode should be locked to the video signal and should be continuous throughout the tape including the header section and breaks. It must be present in the Vertical Interval (VITC) on lines 19/332 and 21/334 ONLY, and on the designated linear track (LTC) at a level corresponding to the line up tape. The LTC and VITC must be frame accurate and co-incident.

Code 00.00.00.00 should correspond to field 1.

The preferred timecode for the first frame of the commercial shall be 10.00.00.00. Under no circumstances should the timecode run through 23.59.59.24.

4.6 Documentation

Information should be presented on a "Recording Report".

The following information should be included on the form, which should accompany transmission tapes:

Commercial:

- Commercial title.
- Commercial unique number.
- Aspect Ratio.
- Total running time
- Commercial production company or agent.
- Information regarding acquisition and post production formats used.
- Names of recording/post production facility house and technical contact name.
- Teletext subtitles on line 335 (where applicable).
- Surround/stereo/dual-channel mono audio.
- Any known impairments.
- Date of recording.
- Details of any compressed video content.

Note: All previous labels/barcodes must be removed, with the box and tape clearly labelled for delivery.

4.7 Delivery of Commercials:

Transmission Library
The Southern Transmission Centre
ITV
Upper Ground,
London, SE1 9LT

Transmission Library
The Northern Transmission Centre
The Television Centre,

ITV Yorkshire,
Kirkstall Road,
Leeds,
West Yorkshire,
LS3 1JS

4.8 Widescreen Delivery

All commercials must be delivered in 16:9 anamorphic format shot and protected for 14:9 – AFD6

5. DELIVERY REQUIREMENTS FOR FILE DELIVERY

ITV are now able to offer an alternative method of delivery to tape and the commercial playout and we now offer delivery by file.

5.1 File delivery process

To deliver by file, you must contact your ITV Sales representative who will put you in touch with one of our partners or directly with ITV Transmission if you wish to deliver by file.
If you are delivering to one of our partners, you have 2 ways of doing this

1. By Digital Betacam tape or
2. By FTP.

5.2 Technical Requirements

In addition to the technical requirements in section 4, there are a number of additional requirements that need to be adhered to if you are delivering direct by file to ITV. Please discuss this with your ITV Sales contact.

6. TECHNICAL APPENDICES

Technical Appendix 1

VTR LEADERS

Technical Appendix 2

SUBTITLES

Technical Appendix 3

FLASHING IMAGES AND REPETITIVE PATTERNS

Technical Appendix 4

TYPICAL SOUND LEVELS

Technical Appendix 5

16:9 FULL HEIGHT VTR CLOCK

Technical Appendix 6

VIDEO BLANKING SPECIFICATIONS

TECHNICAL APPENDIX 1

VTR LEADERS STEREO

Timecode	Dur (m:s)	Video	Audio 1	Audio 2	Audio 3	Audio 4
09:57:30:00	00:30	Black level	Silence			
09:58:00:00	01:30	100/0/100/0 Colour bars	Interrupted Tone 1kHz	Continuous Tone 1kHz	Interrupted 400Hz	Continuous 400Hz
09:59:30:00	00:10	Ident & clock	Silence			
09:59:40:00	00:05	Ident & clock	Optional verbal ident			
09:59:45:00	00:12	Ident & clock	Silence			
09:59:57:00	00:03	Black level	Silence			
10:00:00:00	--	COMMERCIAL	COMMERCIAL START AUDIO & VIDEO			
10:00:00:12			COMMERCIAL START KEY AUDIO			

VTR LEADERS MONO

Timecode	Dur (m:s)	Video	Audio 1	Audio 2	Audio 3	Audio 4
09:57:30:00	00:30	Black level	Silence			
09:58:00:00	01:30	100/0/100/0 Colour bars	Interrupted Tone 1kHz	Interrupted Tone 1kHz	Interrupted Tone 1kHz	Interupted Tone 1KHz
09:59:30:00	00:10	Ident & clock	Silence			
09:59:40:00	00:05	Ident & clock	Optional verbal ident			
09:59:45:00	00:12	Ident & clock	Silence			
09:59:57:00	00:03	Black level	Silence			
10:00:00:00	--	COMMERCIAL	COMMERCIAL START AUDIO & VIDEO			
10:00:00:12			COMMERCIAL START KEY AUDIO			

TECHNICAL APPENDIX 2

SUBTITLES

Subtitle data must conform to the requirements of the current ‘World System Teletext Technical Specification’ published by the UK Department of Trade and Industry.

Delivery Requirements:

If subtitles are required, they must be provided on Line 335 of the transmission master copy.

Where a tape is provided with integral teletext subtitle data in order to ensure satisfactory transfer of the teletext data to the viewer without further processing the following conditions must be met: -

Page Number for	888 (i.e. page 88 in magazine 8)
Line Number for	335 ONLY (Line 22 must not carry any teletext subtitle data signal.)

Position of Subtitles on the screen

Displayed subtitle rows must be located so that they never obscure any in-vision, superimposed, message or open caption. Care should also be taken to ensure that subtitle rows do not obscure key parts of the visual action or are outside the safe active picture area.

TECHNICAL APPENDIX 3

FLASHING IMAGES AND REPETITIVE PATTERNS

Television is by nature a flickering medium (because of the 50Hz refresh rate of typical TV receivers and the 25Hz effect of interlaced scanning). It is therefore not possible to completely eliminate the risk of television causing convulsions in viewers with photosensitive epilepsy. Steps can be taken, however, to reduce unnecessary risks. The following visual devices should be avoided in television commercials.

Flashing lights or rapidly changing of flickering images should be avoided if they were to be positioned near the centre of the screen or if occupy more than around 10% of the picture area and if they change in brightness by more than 10%. Changes in colour are not a problem as long as the luminance level doesn't change with the colour.

Prominent and regular patterns that cover large proportions of the picture area should also be avoided, especially if they represent bars, spirals or "dartboard" patterns. Moving or flickering regular patterns are particularly hazardous.

Care needs to be taken with computer generated images, which if highly detailed, can cause a high degree of 25Hz inter-line flicker in the displayed TV picture.

Further details can be found on the OFCOM website – http://www.ofcom.org.uk

Examples of flashing images are:

Repeatedly cutting a caption background from light to dark or dark to light.
Mixing or cutting different images with different brightness levels in short sequences.
Stroboscopic lighting effects and the use of flash photography.

Please contact the ITV Technology contact for guidance when necessary.

TECHNICAL APPENDIX 4

TYPICAL SOUND LEVELS

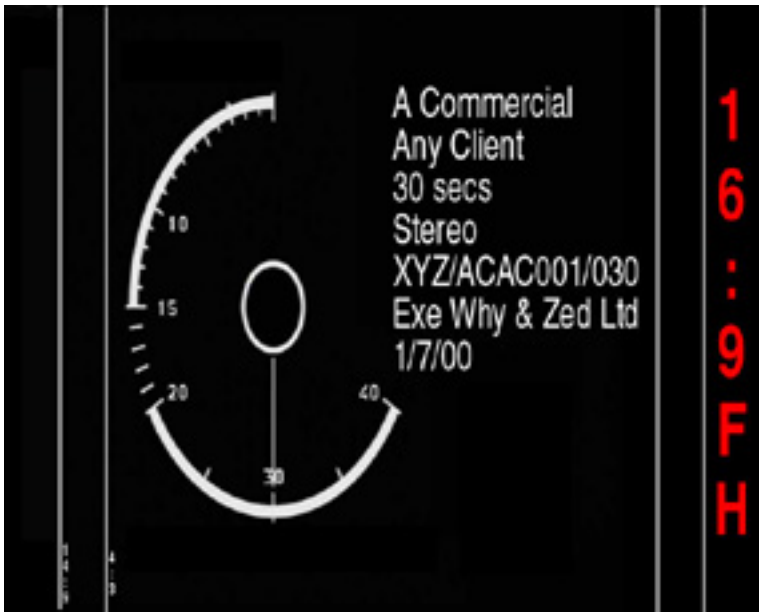
The following sound levels are indicative. Whilst not absolute, if used as a guide they will help producers to achieve a dynamic range of sound best suited to the broadcast television medium. Heavily compressed audio peaking to 6PPM is not acceptable. Please see the guide below.
The numbers below refer to those on the meter display of a PPM to specification BS6840: Part 10.

MATERIAL	NORMAL PEAKS	FULL RANGE
Dialogue	3 - 5	3 - 6
Uncompressed Music	5	2 - 6
Compressed Music depending on degree of compression	4	2 - 4
Heavy M & E gunshots, warfare, aircraft, loud traffic, etc.	5 - 6	-
Background M & E office/street noise, light mood music etc.	1 - 3	-

In general, all compressed commercial material delivered to ITV should not exceed 4 on a PPM.

TECHNICAL APPENDIX 5

16:9 Full Height VTR Clock



TECHNICAL APPENDIX 6

VIDEO BLANKING SPECIFICATIONS

Material that is acquired as digital component must comply with EBU reference document 'TECH 3267-E'.

Material that is acquired as digital composite must comply with EBU reference document 'TECH 3280-E'.

All material - when analog PAL blanking is applied, the active picture boundaries (horizontal and vertical) must have constant timing and not be less than the blanking tolerance as contained in the 'IBA Code of Practice for Television Studio Centre and Outside Broadcast Performance', 1980 Edition, Issue 3.

EBU website: www.ebu.ch

DOCUMENT OWNER & REVISIONS

Original Version by Andy Lucas

Version	Revision By	Date
1	Andy Lucas	01/06/2003
2	Andy Lucas	17/09/2003
3	Andy Lucas/James Robinson	14/4/2004
3.1	Andy Lucas	1/9/04
4	Andy Lucas (ITV Version)	1/4/05
4.5	Andy Lucas	1/11/05
5.0	Andy Lucas	1/6/06
5.1	Andy Lucas	1/7/06
5.2	James Robinson	28/08/2007