

1. SCOPE

This Operational Practice recommends the format, and quality of commercial product delivered to a broadcaster by NON-videotape transport systems.

Additionally, this Operational Practice recommends the necessary minimum functionality of the delivery system.

2. GENERAL

2.1 This Operational Practice describes delivery systems, which deliver commercial product via satellite, land-line or physical data storage media.

2.2 The delivery system may deliver its contents to either –

- (i) A broadcaster's 'off line' or 'near line' commercial storage system, or
- (ii) A broadcaster's 'on line' commercial storage system.

2.3 The data reception system, associated server, data base and the interface to the broadcaster's plant shall be at the Distributor's cost and the format of the video/audio signals ex the interface shall be by agreement between the Distributor and the Broadcaster.

3. DEFINITIONS

3.1 Distributor

The organisation responsible for accessing and transmitting the commercial to the destination.

3.2 Destination

The broadcaster or organisation receiving the commercial.

3.3 Standard Definition

3.3.1 Standard Definition is a 625 total lines, 576 active lines, 25 frames per second, 2:1 interlaced signal produced in agreement with the specifications of ITU-R Rec. BT 601.¹ The image aspect ratio shall be full height 16: 9. However, for legacy material an image aspect ratio of 4:3 "pillar boxed" may be accepted.

The associated audio signal should be a Dolby Surround (Pro Logic II) encoded stereo pair with the centre and surround information encoded into the Lt and Rt signals. For archival material a stereo pair may be accepted.

¹ The companion signal interface document is ITU-R BT.656-4 *Interfaces for digital component video signals in 525-line and 625-line television systems operating at the 4:2:2 level of Recommendation ITU-R BT.601.*

- 3.3.2 Vertical and horizontal blanking shall be in accordance with ITU-R Rec. BT. 601 which specifies an active digital picture line width of 720 pixels, commonly called 'Narrow Blanking'. However, it is recognised that 'wider' blanking corresponding to an active line of 702 pixels is not uncommon. This is due to intermediate interfaces which use 'Nominal' blanking of 12 uS. EBU Tech. Rec. R-92 1999 recommends that the image content intended for display be constrained to the central 702 pixels of the digital line. Reference to Annex A of this Operational Practice indicates that only the central 702 pixels will normally reach the display i.e. pixels 9 – 710 inclusive.

The centre of the picture should retain its position throughout all production processes unless there are creative reasons to deliberately do otherwise. The horizontal centre of the image is located between pixels 359 and 360. The vertical centre of the image is located midway between line 167 of field 1 and line 479 of field 2.

3.4 High Definition

- 3.4.1 High Definition is a signal produced in agreement with the specifications of ITU-R BT. 709-4.²

- 3.4.2 The aspect ratio shall be a full height 16: 9 image. The preferred video format for the exchange of commercial material is:

1125 lines total per frame
1920 horizontal pixels by 1080 active lines
25 frames per second, 2:1 interlace

- 3.4.3 The associated audio signal should be 6 discrete channels representing Left / Centre / Right / Left Surround / Right Surround / Low Frequency effects.

These audio signals shall be carried with the video by means of an agreed audio multiplex.

The minimum audio requirement shall be a Dolby Surround (Pro Logic II) encoded stereo pair with the centre and surround information encoded into the Lt and Rt signals.

² The companion signal interface document is ITU-R BT.1120-3 *Digital Interfaces for HDTV studio signals conforming to Recommendation ITU-R BT.709-4*.

4. VIDEO REQUIREMENTS

4.1 Common Video Requirements

With respect to image shape, television broadcasters are currently in a transitional period from 4:3 images and 4:3 displays to 16:9 images and 16:9 displays. To ensure that both displays can simultaneously produce satisfactory images, some steps are necessary at image capture and at post production. These steps will be necessary for the duration of the transitional period.

- 4.1.1 The commercial shall be produced in a full height 16:9 Aspect Ratio format - and shall be delivered to the broadcaster in that format. It shall also be produced so that there is meaningful and useful image content to the 16:9 image area limits³.
- 4.1.2 To enable transmission in the analogue 4:3 service, the original 16:9 product shall be shot and protected, including essential graphical content, such that a satisfactory centre cut 4:3 version may be extracted by the broadcaster.

Transmitted Video	Display on 4:3 Screen	Display on 16:9 Screen
	<p>Full Frame 4:3 centre-cut</p>	<p>Full Frame 16:9</p>

- 4.1.3 If commercial producers observe the requirements of 4.1.1 and 4.1.2 then acceptable presentation will occur. Failure to observe these requirements will cause problematic presentation.
- 4.1.4 All titles and essential information must fall into the safe areas defined in Annex A and B. Refer Annex C for Recommended Text Size.

³ For commercial producers who wish the 4:3 analogue service image to appear to be letterboxed [i.e. black bars at the top and bottom of the image] they should create a final 16:9 product where the black bars at the top and bottom of that image are each of no more than 36 lines in height [for standard definition]. This letterboxed image is then using 87% of the active lines available.

Transmitted Video	Display on 4:3 Screen	Display on 16:9 Screen
	<p>Full Frame 4:3 centre-cut</p>	<p>Full Frame 16:9</p>

- 4.1.5 Maximum video levels of commercial material with reference to line-up signals shall be 700 + 25mV for luma (Y) and 700mV (peak to peak) i.e. ± 350 mV for each colour difference signal (P_r , P_b). Whatever the combination of luma and chrominance components the signal shall not produce an R.G.B. or PAL coded gamut error when measured by an appropriate instrument.

Black level shall not extend below blanking level (0mV luma).

- 4.1.6 If the commercial or, part thereof, comes from a non 50Hz source, then the following will apply:

If the commercial is captured on film then the product shall be a true 625/50 or HD1125/25 frame/50 field transfer of the original film product. In other words not a standards conversion. However, any product mastered at 24 frames progressive shall be converted to 25 frames via a VTR speed change.

If a commercial is originated on film but post-produced on videotape in the 525/60 or HD 1125/60 domain, then the supplied product shall be a standards conversion via, in the case of 525/60, the TK3:2, DEFT or Image FIT systems. In the case of an HD1125/60 original, the supplied converted videotape shall be a standards conversion which ensures the elimination of temporal motion artefacts. Most recently in the HD domain this has become possible via 2 systems – either a ‘motion vector compensated’ standards conversion process, or, by means of a ‘Reverse Telecine’ process producing a 24 frame product which must then be converted to a 25 frame product.

If a commercial is originated using electronic cameras in the 525/60 or HD 1125/60 domain then the supplied product shall be a standards conversion via a ‘Motion Vector Compensated’ standards conversion system.

Again, the object is the elimination of temporal motion artifacts.

- 4.1.7 If a commercial is originated on film the horizontal and vertical instability of the image shall not be worse than 0.05% of picture height. The rate of any picture movement shall not be subjectively annoying.

The film elements shall be clean and free of both surface dirt and printed dirt and shall not have any emulsion or base side damage.

- 4.1.8 Commercials shall be produced and post-produced entirely in the digital component domain. Where archival material was originated in the composite domain, care is necessary to ensure that any burst to chroma phase errors do not exceed 5° since these errors cannot be corrected on playback.

In all cases a commercial shall be of the highest quality suitable for television broadcast without further processing of the picture. Where a commercial is produced as Standard Definition, the quality shall be such that an acceptable up-conversion to a HD resolution level can be made.

4.1.9 If the commercial is delivered by satellite or land line, then the delivery system shall provide the minimum functionality as described in Clause 6.

4.1.10 If by agreement between the parties (commercial producer, production house and broadcaster) a commercial is delivered on a physical medium other than videotape, then -

If the recording consists of an SDI or HD SDI signal then the delivery system shall provide the minimum functionality as described in Clause 6.

4.1.11 In association with the general Video/Audio quality requirements set out in this document, there will be an additional requirement when the delivery system involves data compression.

It will be necessary to ensure that no visible or audible artifacts are created by the concatenation of the following –

Delivery Payout to Destination
Network distribution
Broadcast re-transmission.

5. Material eXchange Format (MXF)

- (a) Australian television broadcasters are investigating the requirements for implementation of the SMPTE Material eXchange Format (MXF). The specifications under consideration are:
 - SMPTE 377M *Material eXchange Format (MXF) File Format Specification (Standard)*;
- (b) As a minimum for initial operations.
 - SMPTE 381M *Material eXchange Format (MXF) Mapping MPEG streams into the MXF Generic Container (Dynamic)*.
- (c) It is essential to ensure that the Distributor and the Destination employ the same data compression and coding systems so that the unwrapped MXF file may be satisfactorily decoded.
- (d) This Clause will be further developed as needs arise and as further standards are developed for mapping signal formats to the MXF file format.

6. DELIVERY SYSTEM.

The delivery system shall provide the following minimum functionality:

6.1 Metadata.

The delivery system shall include metadata as part of the delivery package providing all necessary data required by the Destinations administrative and/or Presentation system.

This metadata shall include, but not be necessarily limited to the identification information specified in Clause 10.5.

If the commercial is delivered as a package containing the commercial message only (such as delivery directly into the broadcaster's transmission server), then – The timing (time duration) of the commercial shall be determined as in Clause 9.

6.2 Delivery System Storage.

A delivery system shall be provided with a Destination based server system of sufficient capacity to hold all delivered commercials for a period of at least 6 months.

Associated with the destination server there shall be a database containing all metadata relevant to the delivered commercials. External access to the database shall be possible, enabling browsing and updating, if necessary, by the Destination's Traffic/Sales and/or Presentation system.

For reasons of security there shall be a log-on facility providing authorised access only.

6.3 Play-out functionality.

The Destination server shall include a local management system, associating media files and metadata. It shall also manage local or remote control of the server, handling functions such as clip cueing and play out.

It shall be possible to format each commercial item (reference Clause 10) in any form ranging from that defined in Clause 10 to a commercial content only format i.e. first frame to last frame of commercial content only.

The management system shall provide for 2 methods of commercial play-out:

- (a) single items, one at a time as requested by the Destination's system.
- (b) a "stack" of items compiled either at the server data base or as requested by the Destination's system. This "stack" can represent selected random items or be characterised as items delivered "this day" or "this week".

The arrival of a commercial shall be flagged by the Distributor to the Destination by a system which is directed to the Destination's Traffic/Sales Department. The "flag" will also indicate whether the commercial is booked for transmission by the Destination or any affiliated station/stations.

6.4 Database Utilities

All functions and actions of the server/data base shall be monitored and printed reports can be requested of all actions.

Commercials may be searched for by using a number of possible descriptors – Key Number, House Number, Title, Product, and Client.

6.5 Closed Captions

The delivery system shall be transparent to any "Closed Caption" information on the original material supplied to the Distributor.

7. SUBJECTIVE VIDEO QUALITY

7.1 Common Subjective Video Quality

7.1.1 Picture quality appreciation and production grading shall be made in a Review Room which meets SMPTE recommendations for that purpose, including a 6500°K illuminant monitor surround (SMPTE RP 166⁴).

7.1.2 The picture black level shall appear to be subjectively correct with respect to content, free of any noticeable black crushing, compression or clipped dark areas.

7.1.3 Low key scenes shall have sufficient contrast and APL (average picture level) to appear acceptable under typical domestic viewing conditions.

7.1.4 Picture white areas where detail is required shall appear normal and free of noticeable highlight compression.

7.1.5 The transient (edge) response shall be crisp and clean - free of any noticeable horizontal or vertical pre-shoot, overshoot, ringing, smear/streak, echoes or telecine afterglow errors.

7.1.6 Moire and fixed pattern noise shall not be visible.

7.1.7 The resulting subjective resolution shall meet the specification of the electro-optical production chain.

7.1.8 Any video noise shall be fine grained (i.e high frequency) and not visible at normal viewing distances. However, the use of MPEG video data compression does require an image which is not only noise free

4 The viewing distance specified in SMPTE RP166 refers to Standard Definition.

but also free of artifacts such as film dirt or scratches or unwanted image movement.

Note: The excessive use of noise reduction will cause motion artifacts and a noticeable loss of resolution. The amount of noise reduction should only be sufficient to minimise noise.

7.1.9 The colour balance of the image shall be essentially neutral i.e. appears to be illuminated by light of 6500°K. The correct hue of skin tones shall be achieved and these skin tones shall be natural and characteristic in both hue and saturation, irrespective of what racial group is being portrayed. The above in no way prevents the use of colour variations for artistic purposes.

7.2 Standard Definition

7.2.1 Standard Definition images shall be viewed on a correctly calibrated grade 1 display, of at least 60cm diagonal and viewed at approximately 5 times picture height⁵. The light emitters shall have EBU phosphor colorimetry. Display peak white brightness shall not exceed 30 foot lamberts⁶.

7.2.2 Standard Definition images must be judged critically with respect to their capacity for upconversion. A high quality 601 level product can produce acceptable HD level material. Equally, poor to average 601 level product will not produce acceptable HD level material.

7.3 High Definition

7.3.1 High Definition images shall be viewed on a correctly calibrated grade 1 display of at least 100cm⁷ diagonal and viewed at approximately 3 times picture height. The light emitters shall have ITU-R BT.709-4 phosphor colorimetry. Display peak white brightness shall not exceed 30 foot lamberts.

8. AUDIO REQUIREMENTS

8.1 Standard Definition

8.1.1 For the Standard Definition commercials the audio shall be a Dolby Surround encoded stereo pair (Pro Logic II). Archival product may be accepted with a stereo pair (Lo and Ro).

8.1.2 Replay from the Destination server will produce Video, Track 1, Track 2 Audio, Track 3, Track 4 Audio in sync.

⁵ The viewing distance specified in SMPTE RP166 refers to Standard Definition.

⁶ EBU Recommendation R23 defines a peak white brightness of 25 foot lamberts. Whereas SMPTE RP166 defines a peak white brightness of - 35 foot lamberts.

⁷ At the date of issue of this Operational Practice, only 60cm and 80cm high resolution 16:9 monitors are available. These will be the only practical choice for some time.

For Stereo recordings

Track 1 shall carry the left channel
Track 2 shall carry the right channel

Optionally, by agreement between the parties, tracks 3 and 4 (AES2) may carry a Dolby E, or other agreed audio multiplex for 5.1 multi-channel audio. This is in addition to the basic track 1 and 2 Dolby Surround (Pro Logic II) requirement which must always be present.

In the case of Dolby E on Standard Definition recordings, the multichannel audio shall, prior to encoding, be advanced with respect to the video by 1 frame. Thus the video and Dolby E audio will be in sync on tape.

- 8.1.3 The audio multiplex shall potentially carry 8 audio channels plus associated metadata.

If Dolby E is specified as the audio multiplex, then in this usage the minimum metadata to be included in the Dolby E signal shall be:

DYNRNG
DIALNORM
AUDIO CODING MODES

- 8.1.4 Within the audio multiplex the track assignment shall be as per SMPTE 320M.

Track 1	Left
Track 2	Right
Track 3	Centre
Track 4	LFE
Track 5	Left Surround
Track 6	Right Surround
Track 7	Lt or Freely Assigned
Track 8	Rt or Freely Assigned

- 8.1.5 The alignment level of the PCM Audio Signal (AES) shall be minus 20 dB with respect to the onset of digital clipping i.e. minus 20dBFS (SMPTE RP.155).

- 8.1.6 The quasi peak recorded audio level⁸, as measured on a quasi peak reading instrument, shall not exceed 11dB above alignment level i.e. -9 dBFS.

- 8.1.7 Volume compression should, where used to provide consistent peak levels⁸ after the final mix, be restricted to a slope of 2:1 with an onset point of -12 dBFS.

⁸ *Quasi peak audio level* is defined as the value of the integrated sum of energy peaks measured in any 10 millisecond period. These quasi peak levels are typically measured using a Peak Program Meter. Instantaneous peaks of shorter duration cannot be measured on such meters.

Broadcasters reserve the right to reduce the audio level on transmission to ensure that the loudness of commercial sound will match that of programs.

8.2 High Definition

8.2.1 For the High Definition commercial the audio should consist of 6 discrete channels representing -Left/Centre/Right/Left Surround/Right Surround/Low Frequency effects.

The minimum audio requirement shall be a Dolby Surround (Pro Logic II) encoded stereo pair (Lt & Rt).

By agreement between the parties tracks 3 and 4 (AES2) may carry a Dolby E, or other agreed audio multiplex for the 5.1 multi-channel audio.

8.2.2 The track assignment shall be:

Track 1	Stereo Lt
Track 2	Stereo Rt
Track 3	
Track 4	

AES2 Audio Multiplex

8.2.3 If multi-channel audio in the form of an audio multiplex is present on tracks 3 and 4 (AES2) then tracks 1 and 2 shall carry a suitably downmixed Lt/Rt version of the multi-channel signal.

Replay from the Destination server will produce Video, Track 1, Track 2 Audio, Track 3, Track 4 Audio in sync.

8.2.4 The audio multiplex shall potentially carry 8 audio channels plus associated metadata.

If Dolby E is specified as the audio multiplex, then in this usage the minimum metadata to be included in the Dolby E signal shall be:

DYNRNG
DIALNORM
AUDIO CODING MODES

Broadcasters reserve the right to edit the metadata for presentation purposes.

8.2.5 Within the audio multiplex the track assignment shall be as per SMPTE 320M.

Track 1	Left
Track 2	Right
Track 3	Centre
Track 4	LFE
Track 5	Left Surround
Track 6	Right Surround
Track 7	Lt or Freely Assigned
Track 8	Rt or Freely Assigned

8.2.6 The alignment level of the PCM Audio Signal (AES) shall be minus 20 dB with respect to the onset of digital clipping i.e. minus 20dBFS (SMPTE RP.155).

8.2.7 The quasi peak recorded audio level⁹, as measured on a quasi peak reading instrument, shall not exceed 11dB above alignment level i.e. -9dBFS.

8.2.8 Broadcasters reserve the right to edit the metadata for presentation purposes.

9. SUBJECTIVE AUDIO QUALITY

9.1 The overall quality shall be pleasing and free of any audible noise or spurious signals (e. g. hum, buzz, distortion, wow, flutter or excessive sibilance) when monitored in a noise free environment on an essentially flat wide-band speaker system.

9.2 The tonal balance, bass to mid range to treble shall be pleasing and natural.

9.3 Stereo and multi-channel material shall have the correct spatial relationships between audio and picture content (such as left-right or front-rear).

9.4 Program audio shall be in lip sync with the picture content.

9.5 Dynamic Range

Due to the differences in audio transmission requirements for Analog/PAL and Digital, broadcasters will seek the following for any given program or commercial:

- (i) That the analog PAL transmission audio and the MPEG standard definition audio is suitably processed to provide the limited dynamic range and consistent levels that this service requires.

⁹ *Quasi peak audio level* is defined as the value of the integrated sum of energy peaks measured in any 10 millisecond period. These quasi peak levels are typically measured using a Peak Program Meter. Instantaneous peaks of shorter duration cannot be measured on such meters.

- (ii) That the digital transmission audio via Dolby Digital (AC-3) coding is not processed but that the appropriate metadata 'DYNRNG' and 'DIALNORM' is included so that the viewer can choose the nature of the reproduced audio.

Where metadata is not delivered with a commercial, the broadcaster reserves the right to author the appropriate metadata.

10. COMMERCIAL TIMING

- 10.1 The duration of commercial or promotional material should be measured from the start of active video to the end of active video.
- 10.2 Sound should commence 0.5 seconds after the commencement of active video. This provides time for the sound channel to be opened after the start of video without risk of sound clipping and provides aural separation between adjacent commercials and program material.
- 10.3 The end of the commercial sound including any sound tag shall occur 0.5 seconds before the end of active video.
- 10.4 Accurate identification of first frame of active video on commercials should be provided. This shall be by the inclusion of a white marker on the color black in the 2 second interval prior to the start of active video, top right of picture, outside picture safe on the frame immediately before first frame of active video. The white marker should be a minimum picture height for SD of 12 lines and minimum width of 18 pixels. For HD, the white marker should be a minimum picture height of 24 lines and a minimum width of 36 pixels.

Timing of the commercial is referenced from the first frame of active video.

11. SPECIFICATION OF ALIGNMENT SIGNALS AND COMMERCIAL IDENTIFICATION

- 11.1 The following describes formats of the commercial product that shall be possible, if required, by the Destinations administrative or presentation systems.
- 11.2 Commercials shall have a minimum 5 seconds of alignment video signal at the start consisting of a colour bar signal of 100/0/100/0 content. This signal shall occupy at least half the picture height. 'Matrix' type alignment signals which meet the intent of the above are acceptable. The colour bar content shall uniquely represent the commercial in question.
- 11.3 Simultaneously with the video alignment signal, and alignment level (as specified by SMPTE RP155) audio tone of 1000Hz shall be present in phase on all tracks intended to carry audio content.
- 11.4 Following the alignment signal, there shall be for a minimum of 2 seconds a visual identification. Legibility of the visual identification is most important to end users. The selected font size shall be consistent with elements of 30 TV lines height in a 576 active line raster to produce a full screen display of the

visual identification. Full screen is such that the image is within the safe graphic area of the format in question. Should the identification be coloured there shall be a desirable level of separation between background and text information. The text luma level should be no less than 500 mV.

11.5 In a typical case, the identification should contain information on:-

- (a) Client
- (b) Product
- (c) Title
- (d) Key Number
- (e) Duration
- (f) CAD Number
- (g) Classification
- (h) Loudness Compliance¹⁰
- (i) Audio format (Stereo, Dolby Surround (Pro Logic), 5.1 Surround)
- (j) Aspect ratio / Protected state of product
- (k) Closed captions
- (l) Agency
- (m) Production Company
- (n) Date

11.6 Following the identification section there shall be 2 seconds of video black and audio silence preceding the first active frame of commercial video.

12. TIME AND CONTROL CODE

If time code is provided by the Destination's server replay then it shall be as follows:

- 12.1 25 Hz Longitudinal Time and Control Code shall be according to ITU-R Rec. BR.780-2 (2004). The time code shall be locked to the video.
- 12.2 24Hz Longitudinal Time and Control Code according to ITU-R Rec. BR.780-2 (2004).
- 12.3 For Standard Definition, the Vertical Interval Time Code (VITC) shall appear on lines 18/331 and 20/333 of the 625/50 analog recording. A digital recording or interface shall carry the VITC on lines 19/332 as D-VITC.
- 12.4 For High Definition, the Vertical Interval Time Code (VITC) shall be according to a standard yet to be identified.

10

Producers will be required to certify that their commercials comply with OP 48 as a condition of acceptance for broadcast. This certification must be in the form of either:

- inclusion of an additional field in the Visual Identification, as specified in Free TV OPs 24, 29 and 36, between the alignment signal and the countdown indicating compliance with OP 48; or
- by prior arrangement with the broadcaster a written certification by the person submitting the commercial that the commercial complies with OP48.

Submission to CAD Pty Ltd constitutes a suitable "prior arrangement with the broadcaster".

- 12.5 Both Longitudinal and Vertical Interval Time Codes shall match and be continuous and ascending for the duration of the signal.
- 12.6 The Time Code shall not pass through 2400 hours for the duration of the signal.

13. CLOSED CAPTIONS – STANDARD DEFINITION

- 13.1 The Australian Standard for closed captioning is for the data to be carried on lines 21/334 for a 625/50 signal. The data format is in accordance with the Australian Teletext System Standard. Caption data shall be distributed, transmitted and monitored according to the requirements of Free TV Australia Operational Practice OP42.
- 13.2 A command to clear any existing caption shall be included in the first half (0.5) second of the commercial. Where closed caption data is included on the signal, the caption information should commence no earlier than a half (0.5) second after the start of active video and a caption erase signal is required (last caption time code out) not later than a half (0.5) second before the end of active video. First caption time code in will be at an arbitrary point determined by content.

14. CLOSED CAPTIONS – HIGH DEFINITION

- 14.1 The specification for the carriage of closed caption data for High Definition is currently under consideration by Australian TV broadcasters.

Annex A.

1. SDTV - SAFE ACTION AND SAFE GRAPHIC AREAS

- 1.1 The recommended SDTV 'Safe Action' and 'Safe Graphic' areas are defined by the following three diagrams. These areas are defined for displays which are driven via some form of analog interface i.e. the existing PAL receiver population or the case of existing 4:3 or 16:9 displays driven by Set Top Boxes (STBs) tuned to a digital transmission.
- 1.2 The active video line length is defined as a nominal 702 pixels which represents nominal PAL active line length (a line blanking width of 12usecs – refer Clause 4.2.2).
- 1.3 The overscan of domestic displays is assumed to be a maximum of 7% of overall picture width or height i.e. 3.5% at each edge but any one picture edge should not exceed 4% of total picture width or height.¹¹
- 1.4 Diagram 1 - Widescreen shoot to protect the 16:9 full image

This indicates the safe areas of a 16:9 widescreen display where there is NO requirement to provide compatibility with a 4:3 display. This would not be a normal situation until such time that all displays are 16:9.

- 1.5 Diagram 2 – Widescreen shoot to protect the 4:3 central zone

For some commercials there will be a need to fully protect the 4:3 central zone for action and graphics. However, the numbers in this diagram do involve a small compromise for the benefit of the 16:9 viewer.

- 1.6 Diagram 3 – Widescreen shoot to protect the 14:9 central zone

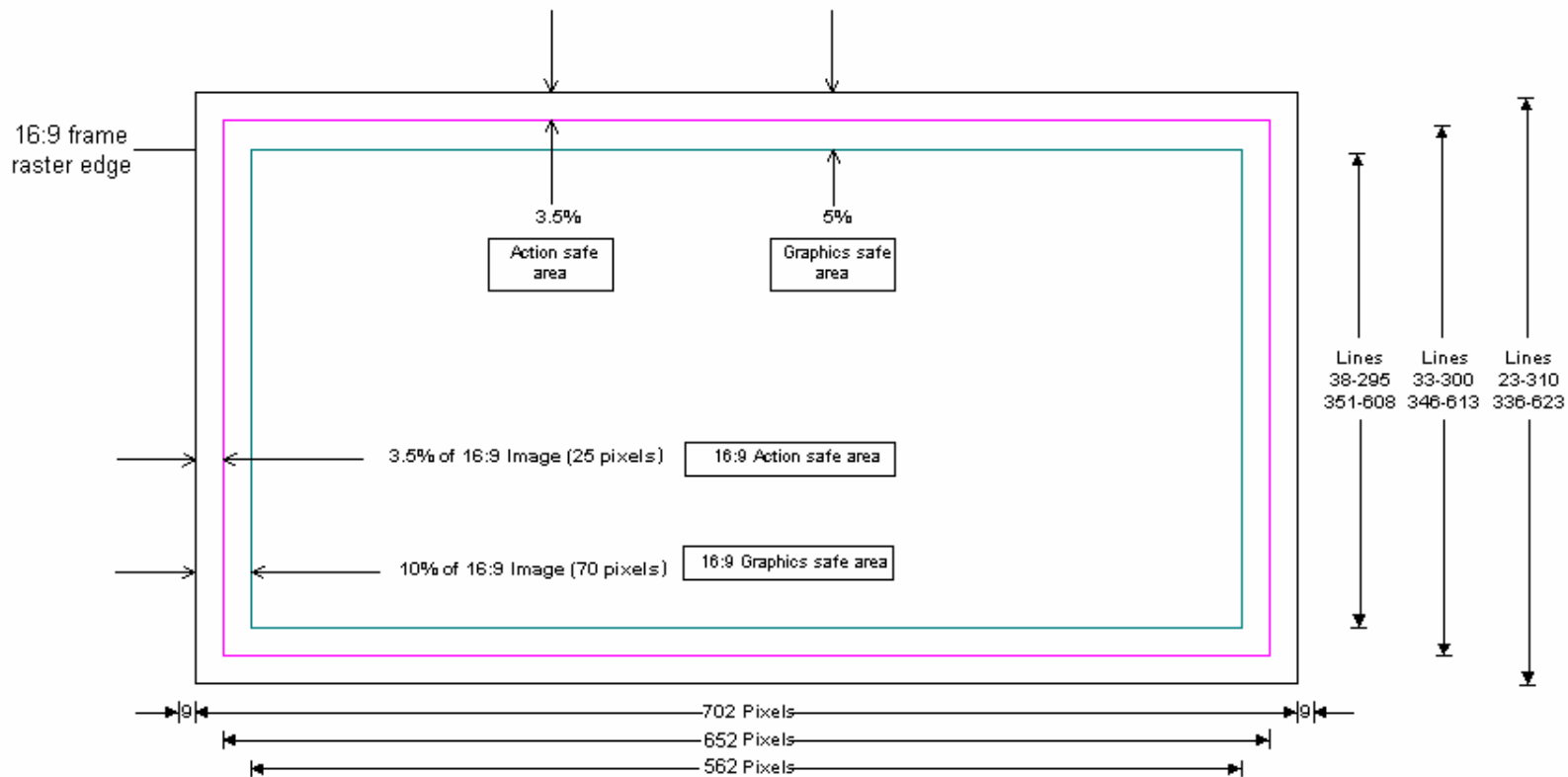
The 14:9 letterbox can be regarded as the compromise for the display of a 16:9 image on a 4:3 display.

Note that the Safe Action area is 14:9 – but the Safe Graphics area has been retained as per the 4:3 central zone. This compromise is necessary to ensure that graphics within a 16:9 widescreen commercial are protected when viewed via a Set Top Box which is producing a 4:3 centre cut out in conjunction with a 4:3 display.

¹¹ It is hoped that at some time in the future, the receiver overscan can be reduced a maximum value of 2%. This will mean that the safe areas can be recalculated to give larger viewable areas.

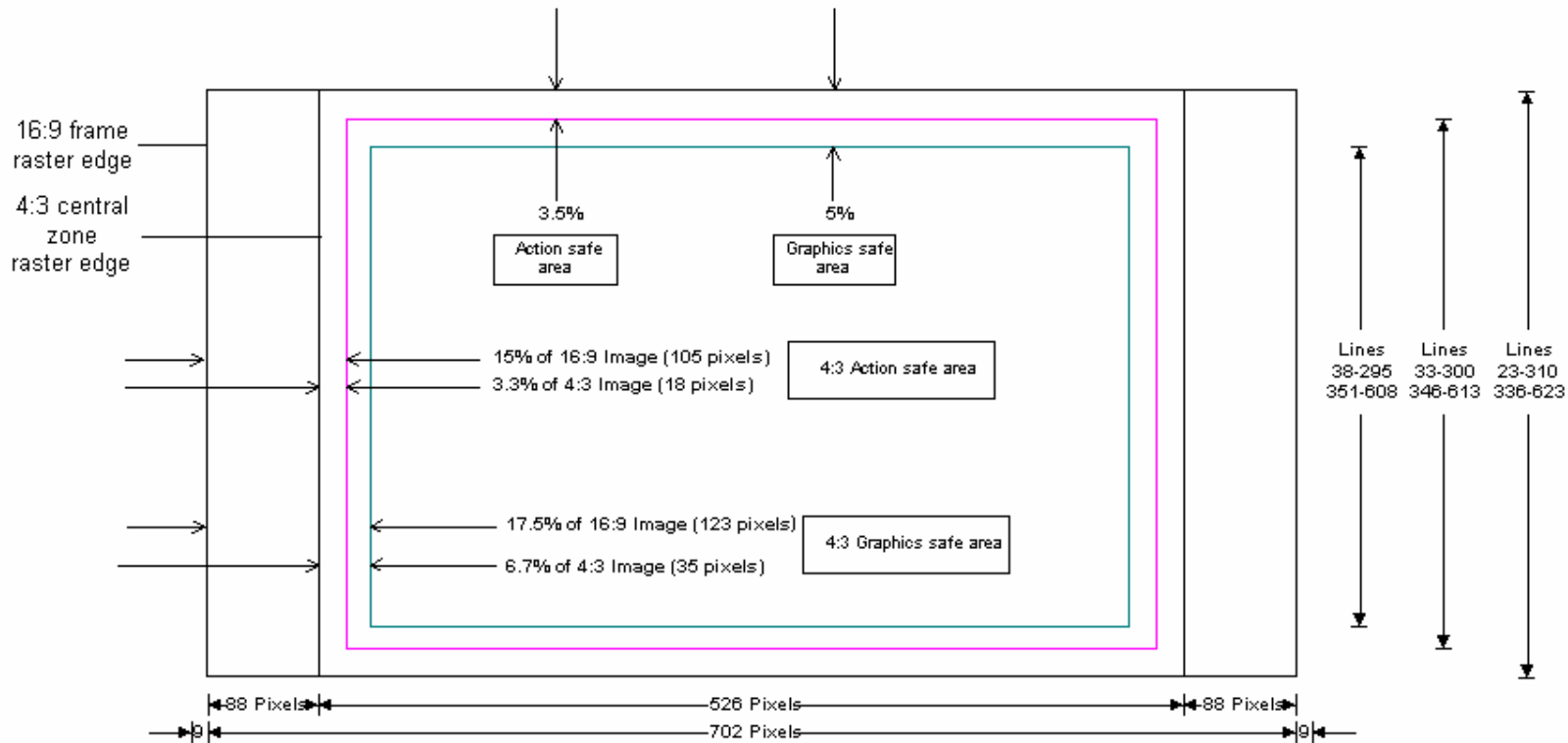
Likewise when analog transmission has ceased, the safe areas can be recalculated on 720 pixel base – not the current 702 pixel base made necessary by analog blanking,

Diagram 1: 16:9 Full Image, defining Action and Graphics Safe Areas (SDTV)



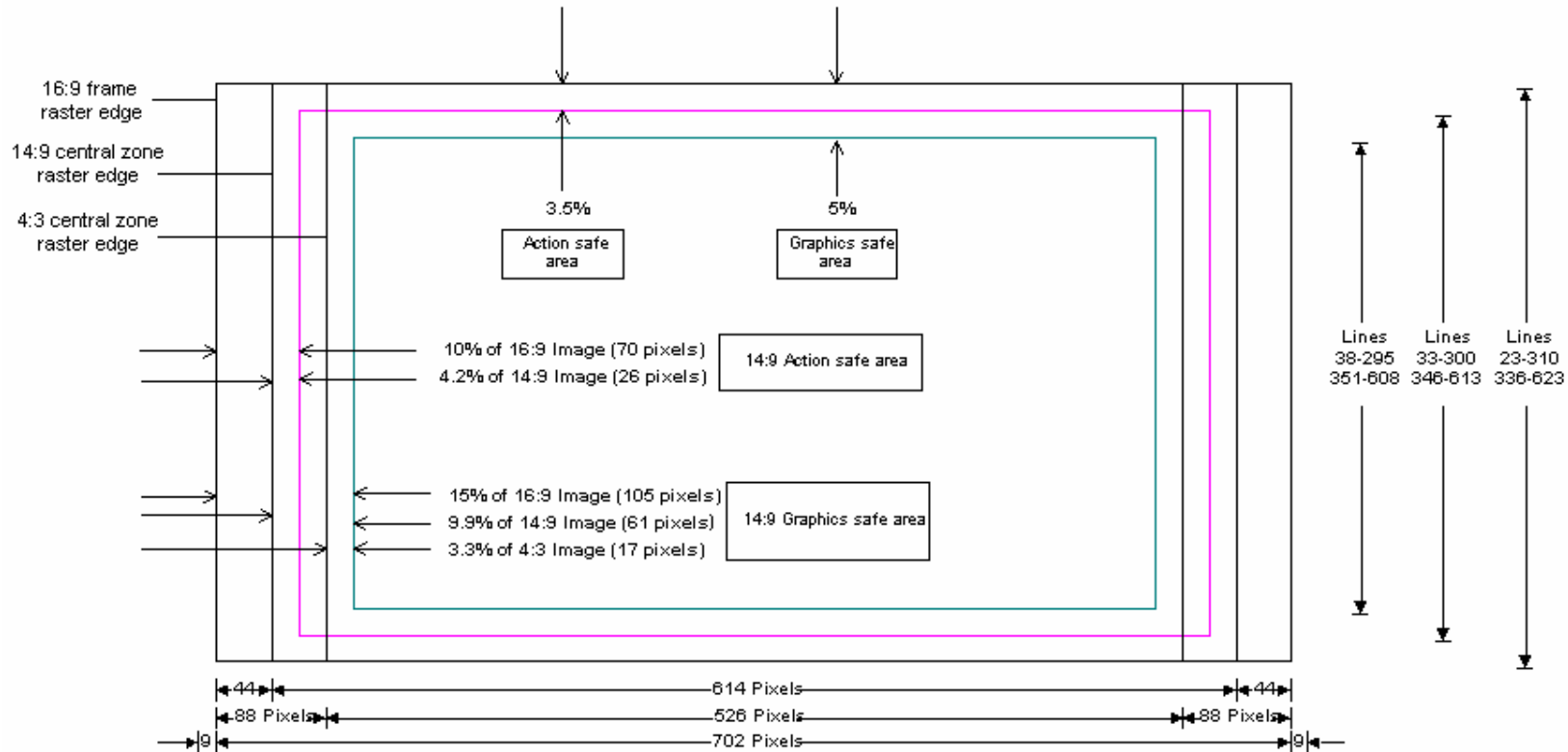
BBC Television - Reproduced with Permission

Diagram 2: 16:9 Shoot and Protect 4:3, defining Action and Graphics Safe Areas (SDTV)



BBC Television - Reproduced with Permission

Diagram 3: 16:9 Shoot and Protect 14:9, defining Action and Graphics Safe Areas (SDTV)



BBC Television - Reproduced with Permission

Annex B.

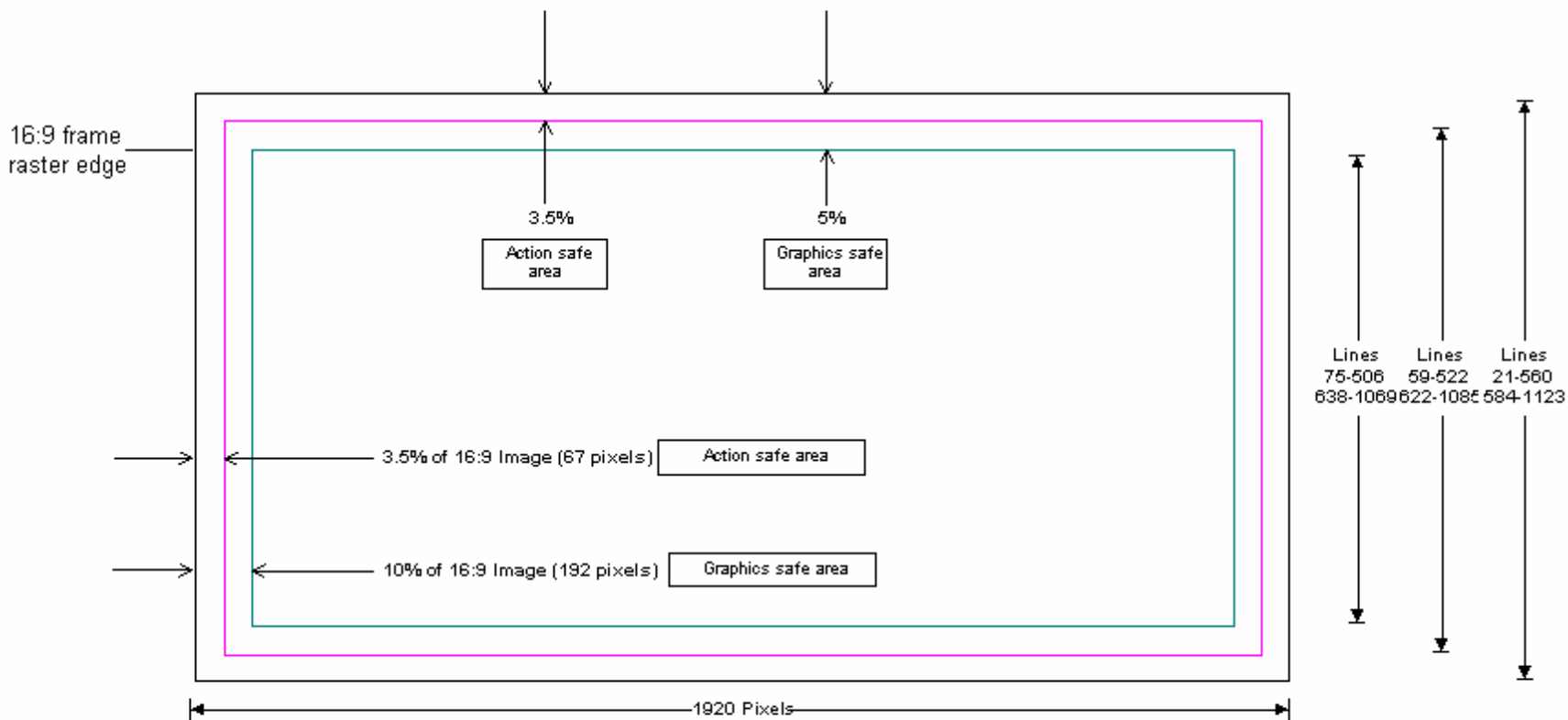
1. HDTV – SAFE ACTION AND SAFE GRAPHIC AREAS

- 1.1 The recommended HDTV 'Safe Action' and 'Safe Graphic' areas are defined by the following three diagrams.
- 1.2 Diagram 1 is the HD transmission situation, 16:9 Shoot Protect 16:9, with a line length of 1920 pixels. The safe areas are calculated to this base. This will not be the normal situation for some time to come.
- 1.3 Diagrams 2 and 3 represent the situation where the HD signal has been down-converted to SD for a 4:3 simulcast service. The SD 4:3 service will involve some form of analog interface where the wide line blanking used produces an active line of 702 pixels. This means that in the HD signal only the central 1872 pixels would be effectively used in the down-converted signal.
- 1.4 Diagram 2 is 16:9 Shoot Protect 4:3. The line length base for calculating Safe Areas is 1872 pixels
- 1.5 Diagram 3 is 16:9 Shoot Protect 14:9. The line base for calculating Safe Area is 1872 pixels. The Safe Action Area is 14:9 but the Safe Graphics Area has been retained as per the 4:3 central zone. This is to accommodate STBs which may produce a 4:3 centre cut when driving a 4:3 display.
- 1.6 The overscan of domestic displays is assumed to be 7% of overall picture width or height (i.e. 3.5% at each edge) but any one picture edge should not exceed 4% of total picture width or height.¹²

¹² It is hoped that at some time in the future, the receiver overscan can be reduced a maximum value of 2%. This will mean that the safe areas can be recalculated to give larger viewable areas.

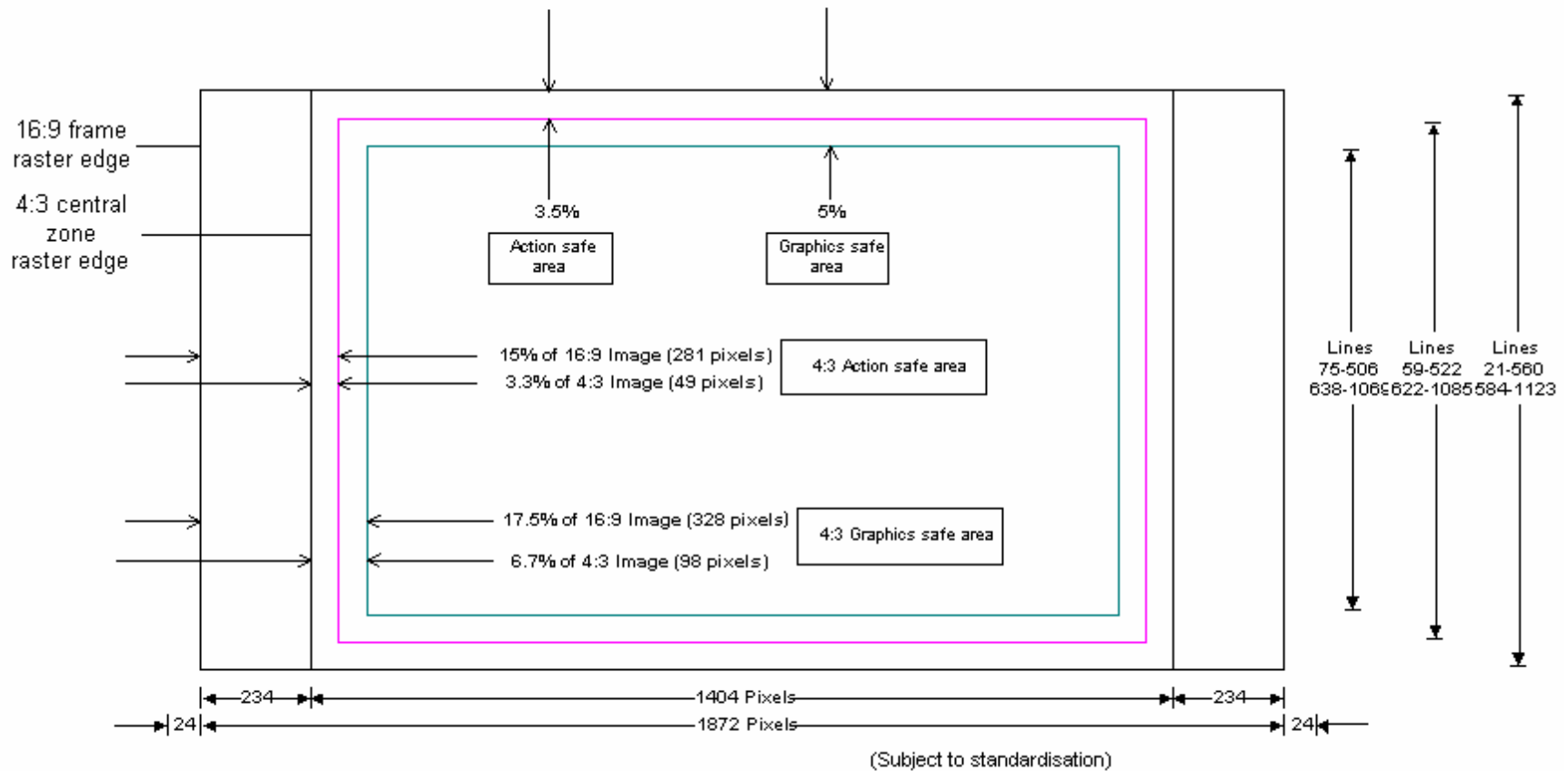
Likewise when analog transmission has ceased, the safe areas can be recalculated on 1920 pixel base – not the current 1872 pixel base made necessary by analog blanking.

Diagram 1: 16:9 Full Image, defining Action and Graphics Safe Areas (HDTV)
[1920x1080 Raster]



(Subject to standardisation)

**Diagram 2: 16:9 Shoot and Protect 4:3, defining Action and Graphics Safe Areas (HDTV)
 [1920x1080 Raster]**



Annex C.

1. Recommended Text Size.

- 1.1 Considering that in the future both commercial product and programmes will be originated in the widescreen 16:9 format.
- 1.2 Considering that it is desirable that text be readable under normal display and viewing conditions and that additionally in certain circumstances there may be a legal requirement for the text to be readable.
- 1.3 Considering that in certain transmission modes and also in certain reception modes the effective height of the image is reduced.
 - (a) For the transmission of a 16:9 original in the 4:3 analogue service, the broadcaster may letterbox the product, thus reducing the effective height of the image.
 - (b) In the reception of the digital 16:9 service the viewers Set Top Box [receiver] may letterbox the product for a 4:3 display, thus reducing the effective height of the image.

The following is recommended:

For standard definition images, the minimum height of the text lower case elements be 15 pixels [15 lines] in a 576 line raster.

For high definition images, the minimum height of the text lower case elements should be 28 pixels [28 lines] in a 1080 line raster.

Annex D.

1. Audio Levels and Loudness.

This annex provides advice on the relationship of this OP and Free TV Australia OP48 *Audio Levels and Loudness*.¹³

The elements of an advertising soundtrack, namely dialogue, music and effects are subject to various processes during production. Where these elements sit in the final sound track, with respect to audio levels and loudness, is the result of a final mix and effectively it is here that the loudness of the soundtrack will be principally influenced.

Most advertisement sound track pre-final mix elements are passed through devices such as *equalisers* and *compressors*, which are designed to enhance their *presence* i.e. to make them sound “up close” or brighter or more immediate. This is referred to as “processing”.

Material that has been compressed will sound louder, even though there is no increase in volume. This is because compression of a sound track raises the energy content of the sound by reducing the dynamic range (i.e. the difference between the loudest and softest levels of the sound) thereby making it more dense.

Many modern processors are not calibrated in dB, have constantly varying compression ratios and are likely to be multi-band devices which apply different amounts of compression in different frequency bands. This makes it difficult for sound track producers to accurately measure and quantify how much compression is applied to a soundtrack. However, prior to the final mix it is recommended that every effort should be made to ensure that the nature of any compression or equalisation used is such that the end result does not produce a sound track with a loudness characteristic which is incompatible with program material.

Broadcasters provide the following advice and recommendations for definition of a compression profile related to any processing applied AFTER the final mix. Figure 1 provides a diagrammatic representation of this simple profile.

If any further peak limiting were to be necessary, it would be provided automatically by the transmission processor.

¹³ Note that at the time of writing there is not yet international agreement on the algorithm for a standardised loudness meter – it is a work in progress.

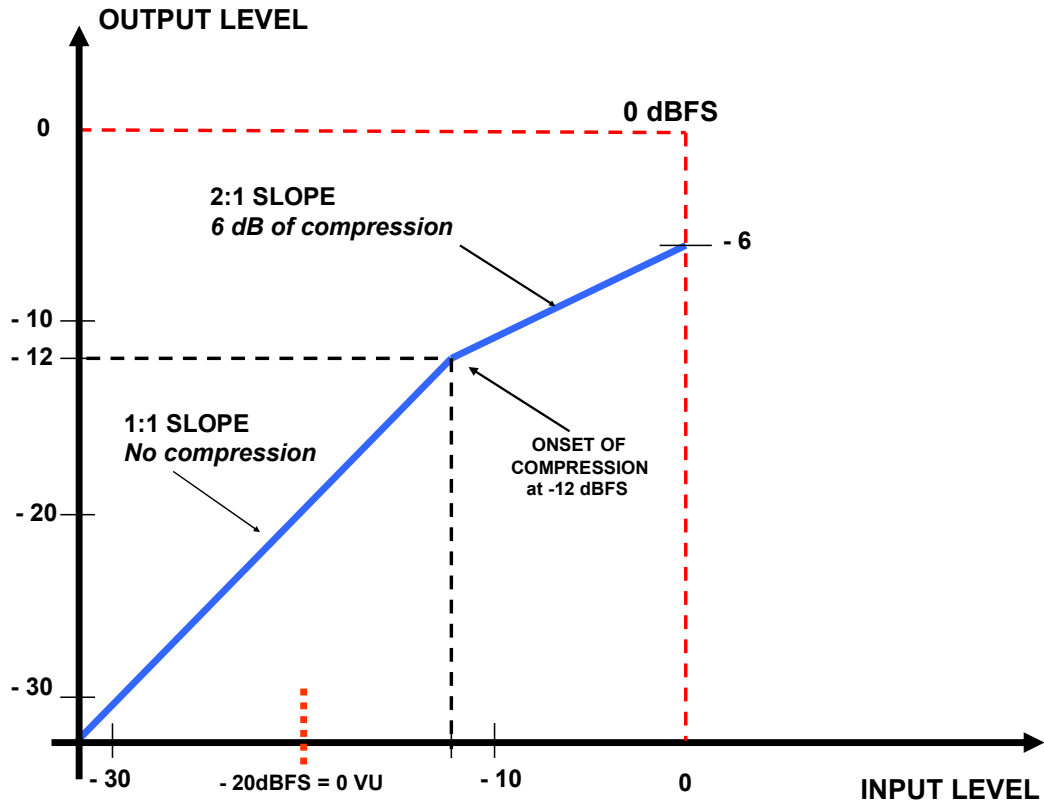


Figure 1