

1. SCOPE

This Operational Practice provides a recommendation for files distributed to Australian broadcasters for evaluation and assessment; not for broadcast. It provides specifications for coding, video, audio and subtitles display.

A file produced to these specifications will be an encoded MPEG-2 Program Stream or AVC/H.264 bitstream created by a software application (or perhaps a specialised hardware encoder) but not by a DVD recorder which would produce DVD-Video files. If the editing equipment/software used to produce the audio/visual material is not able to create a file that complies with OP53, then third party utilities that do are commonly available. The MPEG-2 files produced are expected to have an "mpg" or "mpeg" extension, while AVC/H.264 files are expected to have "mp4" extensions.

Files produced to OP53 specifications do not contain an application layer and will not replay on standard DVD players, but need a software application to replay. For the DVD-Video application, refer to OP55.

After encoding a commercial to OP53 standards it is recommended that it is previewed to verify that the aspect ratio has been correctly indicated. Experience has shown that while vision may be 16:9 native video there has been some difficulty in setting the aspect ratio indicator that is carried within the encoded signal.

The completed preview copy should be checked with a commonly available media player. This should be able to check the correct setting of the aspect ratio indicator as required in Clause 6. As a further precaution the file parameters may be checked using any suitable parameter check program. These include those available from open source ("sourceforge" and freeware) web sites. If the aspect ratio is unable to be correctly confirmed using the media player then it should be confirmed in the sequence header by use of an appropriate check program.

It is expected that an Operational Practice for MXF file format delivery will soon be produced and MXF "wrapping" may in future be employed in file delivery. It is possible that MXF wrapping will be progressively used in this application in future.

2. REFERENCES

AS/NZS 13818.1:2002 *Information technology – Generic coding of moving pictures and associated audio information. Part 1: Systems*

AS/NZS 13818.2:2002 *Information technology – Generic coding of moving pictures and associated audio information. Part 2: Video*

AS/NZS 13818.3:2002 *Information technology – Generic coding of moving pictures and associated audio information. Part 3: Audio*

AS ISO/IEC 14496.10-2006 *Information technology – Coding of audio-visual objects. Part 10: Advanced Video Coding*

ITU-R BT.1379-2 *Safe areas of wide-screen 16:9 and standard 4:3 aspect ratio productions to achieve a common format during a transition period to wide-screen 16:9 broadcasting*

3. DEFINITIONS

- 3.1 **Source:** The organisation responsible for delivering the files to the destination.
- 3.2 **Destination:** The broadcaster or organisation receiving the files.
- 3.3 **Safe Action Area¹:** Region within picture boundary considered to be visible on all typical domestic TV displays that show over-scan pictures so that edge effects are not visible. Current recommended safe action area is 7% overscan or 3.5% on each edge which represents a usable SD picture of 670 pixels x 536 lines.
- 3.4 **Safe Title Area:** Inner region within Safe Action Area that ensures any textual on screen information will not be obscured by excessive over-scan in domestic TV displays. The recommended graticule inside which any text should be located is 10% of picture width and picture height – that is 5% inside each edge.
- 3.5 **GOP:** Group of Pictures – Repeating sequence of MPEG compressed digital format video frames usually commencing with an “I-frame” followed by “P” and/or “B” frames
- 3.6 **Sequence Header:** Carries technical parameters relating to the picture size, aspect ratio etc used in the MPEG encoding process.

4. DISTRIBUTION MEDIUM

4.1 Distribution Method

The distribution method used for the delivery as a file shall be agreed by all parties (Source and Destination). This may be an electronic, non-physical means or a physical data storage medium such as a DVD disc carrying a file.

If distribution is by an electronic means then the delivery shall be to the Destination's server.

If the distribution is on a physical medium and a DVD or CD disc is used, it should be DVD-R or CD that shall be transported in a suitable purpose built case with discs and cases clearly labelled by suitable means. Also for a physical medium, the bitrate limits detailed in section 8 are minimum limits only.

4.2 Number of Commercials Delivered on Physical Medium

If advertisements are delivered via a physical medium, then the maximum number of commercials delivered on a single unit should be agreed by all parties (Source and Destination). Additionally, there must be clear, easy identification of each individual commercial file. Files shall be identified by a suitable name such as the name containing the Key Number.

5. CONTENTS OF FILE

Prior to the commercial that is to be assessed, there shall be a minimum of 2 seconds of 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 Title Area of the format in question. Should the identification be colourised, there shall be a desirable level of separation between background and text information.

¹ Safe Action/Title Area requirements are based on industry and international recommendations such as Recommendation ITU-R BT.1379.

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

- (a) Client
- (b) Product
- (c) Title
- (d) Key Number
- (e) Duration
- (f) Classification
- (g) Audio format
- (h) Aspect ratio / Protected state of product
- (i) Closed captions
- (j) Agency
- (k) Production Company
- (l) Date

Accurate identification of first frame of active video on commercials should be provided. This shall be by the inclusion of a white marker on colour black in the 2 second interval following the visual identification signal, top right of picture, outside picture Safe Action Area, on the frame immediately before first frame of active video. The white marker should be a minimum picture height of 12 lines and minimum width of 18 pixels.

6. VIDEO

The following specifications are required for video material to that will be encoded for delivery to broadcasters for evaluation and assessment:

Resolution (SD format):	720 x 576
Aspect ratio	16:9
Frame rate	50 field/s, 25 frame/s

For legacy material an image aspect ratio of 4:3 "pillar boxed" in 16:9 may be accepted.

All these specifications should be identified in the file header. If legacy 4:3 material is used, this shall be identified in the file header.

7. AUDIO

The following specifications are recommended for program and commercial soundtracks that will be encoded for delivery to broadcasters for evaluation and assessment:

Original Format	PCM audio (not including Dolby E or AC-3)
Sampling rate	48kHz
Stereo	Lt Rt
Where Dolby Digital (DD) derived	mixed down Rt Lt

For Stereo recordings:

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

8. CODING

All the following specifications apply to files distributed by non-physical medium. For files distributed on physical medium, such as DVD, then the bitrates specified are minimum limits only.

The specification for the file format of the commercial product shall be a Program Stream encoded as either:

MPEG-2 Main Profile @ Main Level

Video bitrate	Average 2 Mbit/s
Audio encoding	MPEG-I Layer 2
Audio Data rate	64 kbps
GOP structure	Each GOP shall have a sequence header
Maximum frames per GOP	15

OR

AVC/H.264 Main Profile @ Level 3.0

Video bitrate	Average 1 Mbit/s
Audio encoding	AAC
Audio Data rate	64kbit/s

Other coding schemes may be used by agreement between all parties.

9. CLOSED CAPTIONING

Closed captioning (where included/required) Decoded Closed Caption Teletext "burnt into video" using the intended broadcast position.

Variation to closed captioning display shall be by agreement with all parties.

10. RECOMMENDED TEXT SIZE

Considering that both commercial product and programs are being originated in the widescreen 16:9 format.

Considering that it is desirable that text is 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.

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.

N.B. If the recommendations are followed, but any text is unreadable on screen due to low bit-rate encoding and consequential obscuring artifacts, CAD Pty Ltd may seek another version of the commercial product with increased bit rate.
