dpp
digital production partnership

A PRODUCER'S GUIDE TO
FILE DELIVERY

FOREWORD

Producers are already shooting their programmes on tapeless cameras, and shaping them in tapeless post production environments. But then a strange thing happens. At the moment a programme is finished it is transferred from computer file to videotape for delivery to the broadcaster. When the broadcaster receives the tape they pass it to their playout provider, who transfers the tape back into a file for distribution to the audience.

It is the persistence of videotape in this delivery process that prevents the UK broadcasting industry from moving to truly end-to-end digital production. But 2014 is the year in which that finally changes. The DPP has brought UK broadcasters together first to define a common standard for the delivery of a television programme as a file, and then to set a date – 1 October 2014 – as the moment when all UK broadcasters will accept file delivery.

The existence of a common standard makes this momentous change in the way programmes are passed to broadcasters far easier than if everyone had announced their own way of doing things. But nonetheless the move to file delivery will take a bit of getting used to. And that's why we've produced this handbook.

The handbook explains – from a production point of view – what is involved in the new process. It also gives you a checklist to help you prepare for your first deliveries by file. It's important to remember however that this is an industry-wide change. You will find plenty of people – from colleagues, to post production facilities, to broadcasters, and the DPP itself – who will help you get this right. That's why you'll also find on our website lots of other materials related to file delivery – with some of them designed specifically for those requiring greater technical detail.

- Technical Standards for Delivery of Programmes to UK Broadcasters
- DPP QC Test Criteria
- PSE Devices – Product Guide
- Metadata Application User Guide
- DPP Budget Guidelines

They can be downloaded from the DPP website at:

www.digitalproductionpartnership.co.uk/downloads .

We hope you find this handbook helpful. Your feedback – as always – will be very welcome.

Mark Harrison
Chair, Digital Production Partnership

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OVERVIEW OF THE PROCESS

This handbook aims to provide a user guide to what production companies and programme suppliers need to do to deliver their finished programme to any of the major UK broadcasters as a file instead of a tape. There are several steps that must be worked through before the file is ready to send, and then an appropriate delivery method must be used.

The six-stage process is summarised below.

1

COMPLETE THE PROGRAMME

Complete the programme with final video and audio. Get editorial sign-off. The content creation stage remains largely the same as for tape delivery, right through to finishing, apart from a new loudness measurement technique – called R128 – for which your post production provider will take responsibility.

2

CREATE MXF FILE

Create MXF file from edit system, or other process. This must comply with the DPP Technical Standards. Your editor and post production provider will do this.

3

QC CHECK

Quality Check (QC) the file. An Automated QC process performed by your post production provider should produce a 'QC pass certificate'. An 'eyeball' check carried out by the producer is also required.

4

PSE CHECK

Carry out a Photo Sensitive Epilepsy (PSE) check of the file, and produce a 'PSE pass certificate'. Some QC test systems include PSE testing, in which case the PSE pass will be included in the QC pass. Again this is part of the technical process of finishing in post production.

5

ADD DPP METADATA

Add descriptive and technical metadata to the file. Production will need to provide information to the post production provider so the final metadata can be added to the file during this step. The finished file will then be wrapped.

6

DELIVER FILE

Deliver the file. The post production provider will do this. This process confirms that the file is complete and ready to be delivered as well as confirming the file has actually been delivered.

The order of these tasks may vary depending on the chosen workflow (and the range of deliverables for the production) and some activities may take place more than once. The workflow is best discussed with the post production provider and should be agreed well in advance.

Each of these steps is explained in this handbook and further technical detail can be provided for operational and facilities staff via documents available on the DPP website.

1

COMPLETE THE PROGRAMME

1.1 Complete final Video and Audio

The programme is edited in the same way as for tape workflows, except that the edit is no longer played out to tape at the end. Some metadata may be entered at this point, depending on the edit system, but the editor can advise. The finishing process will still include any grading, titles, effects and any required 'legalisation' (see below). However, the audio mastering/dubbing and layback process could well be different for file-based workflows. This is the one area where new workflows could be considered in order to 'marry' the completed audio with the completed video.

File production does not change the process, which still covers:

- Video editing. This may include grading throughout the edit, plus graphics and effects, or these may be added separately.

- Colour grade, if there is one, of the completed programme.

- Any additional required titles/graphics and effects may be added.

- During finishing any 'legalisation' may be carried out on finished edit. This process ensures that video and audio signals conform to various technical guidelines.

- Audio editing or mastering and dubbing (if not completed in the video edit) is then completed to match the video edit. In a file-based workflow the final audio may then be included in the master programme file with the completed video. In a tape-based workflow the completed sound mix may have been played back to the edited master tape during audio layback. In this respect the file-based workflow does depart from traditional tape workflow.

In the file-based workflow any changes to a finished programme, no matter how slight (such as the spelling of a name in the credits) will require more work than in a tape-based workflow. This is because the change in the edit will require a repeat of the file export and metadata wrapping for the whole file. Insert editing is not generally available with current products. Please see section 2.1 for information on what to do in this situation.

1.2 Monitor Audio Loudness to R128

The audio post production provider should now be mixing audio to the EBU R128 loudness standard, and not PPM levels. This will be a mandated requirement for file-based deliveries. This requires a different type of audio meter for sound post production from the traditional Peak Programme Meter (PPM) and attempts to model the way our brains perceive sound: our perception is influenced by frequency and duration of sound.

'Mixing to PPM 6' was about avoiding analogue peak distortion on transmitters and tape, not about loudness. Peak Programme Meters were effective at this up to a point but had mechanical limitations which missed the true peaks, which in practice could be many decibels above PPM indicated values. R128 allows **true peaks** to be measured as well as the overall **loudness** across the whole programme, or programme part. These two R128 specified measurements are included in the DPP Technical Standards. There are others but at present it is only these two which are mandated by the DPP.

The production company should tell the post production provider whether the programme is mixed to PPM or R128. This should be based on the version of the Technical Standards to which the production company is contracted to deliver. As a rule, file-based delivery should be R128 but PPM may be acceptable as long as the relevant standard is flagged in the delivery.

The production may be contracted by the broadcaster to deliver in 5.1 Surround Sound. This must be delivered as discrete audio tracks, not Dolby-E encoded. Surround Sound programmes need Dolby metadata to be sent to HD TVs and provision for this will be integrated into version 1.3 of the DPP Metadata Application which will enable the inputting and editing of audio metadata.

2 CREATE MXF FILE

The DPP assumes that the production company or post production provider will create most finished programme video and audio in a non-linear edit system such as Avid, Final Cut Pro, or Premiere Pro, in the required format. An output MXF file should then be created which will contain both the audio and video encoded material, and potentially some metadata. The video and audio tracks must be encoded and structured according to the DPP Technical Standards as a compatible AS-11 OP1A MXF file. The editor or technical operator will know how to do this with appropriate set-ups on the equipment. **They will also be able to advise on how much time to allow, as this process may take longer than laying back to tape on some equipment.**

It is important that the programme is encoded correctly according to the AS-11 DPP format or there is a risk that it may not play out correctly.

If any late changes need to be made, for compliance purposes for example, or there is a technical fault, a new file must be created and published with a new identifier to avoid confusion. This is currently a slower and more complex process than the tape-based 'insert edit' equivalent but it is expected that it will become quicker in the future. Files must not be over-written to avoid the incorrect version being used in error.

2.1 Late changes before TX

All broadcasters will have their own specific guidelines as to how to 'recall' file content for technical or editorial correction; a process quite different from getting a tape sent back for re-editing. Apart from individual broadcaster's contact information and slight variation in process, there are general principles common to all broadcasters that must be strictly adhered to when the need arises to make corrections to a file already delivered to a broadcaster for transmission.

First, the production should contact the advised contact within the broadcaster requesting permission to make a correction to previously supplied content. Once permission is granted by the broadcaster, and the individual broadcaster's re-delivery process has been clarified, the technical or editorial correction can be made.

It is assumed the supplier will have retained all media to enable amendments or corrections to be carried out. **The next step is absolutely vital to avoid confusion and potential loss of content: the new file must be given a new version number, and the file name updated.**

It is extremely important that the latest version of the file is transmitted, so to avoid confusion any previously supplied file version will be deleted by the broadcaster.

FILE RE-NAMING AND NEW VERSION NUMBER

- The amended file must be re-named with a different version or production number. **This new number will be supplied by the broadcaster.** It is extremely important that ALL amended instances of an asset change their version or production number if any editorial or technical changes are made to the content. This is already a well established process within all broadcasters and must be strictly adhered to, to avoid the wrong content going to air.

- Unlike the tape world (where there may be only one copy of the tape) a file can be copied, resulting in more than one essence of that file residing on a number of servers within a playout facility, so it is even more crucial in file-based workflows that any redelivered file changes version or number.

The remaining steps are as for all file-based delivery, and are described in the following sections of this handbook i.e.:

- QC and validate amended file ensuring it complies with the broadcaster's Technical Standards;

- Enter descriptive metadata;

- Enter technical metadata and wrap file;

- Re-deliver amended file using delivery method agreed with the broadcaster.

0.1

0.2

0.3

3

QC CHECK

Quality Control (QC) checking should take two forms: 'eyeball tests' by the producer and editor to make sure the programme is editorially, visually and audibly correct; and the technical checking against set parameters. The production company, post production provider or QC provider will perform technical QC following editorial sign-off and legalisation against broadcaster guidelines. They will be able to advise how long the QC processes are likely to take, especially the use of Automated QC tools, and the best order in which to carry out the checks. **For example, eyeball tests may be carried out before and/or after the final file is created: it depends on the workflow.**

The DPP and EBU are helping by making the tests and tolerances standard. Full technical details of the DPP QC requirements can be found here:

www.digitalproductionpartnership.co.uk/downloads/standards .

There will always be permissible exceptions, e.g. archive footage, which should be detailed in the QC report. Producers are responsible for approving this sort of material for TX at the eyeball check, and noting it in the QC report as editorially allowable. These subjective flags do not constitute a quality failure. This is no different from the current situation.

3.1 Eyeball tests

The eyeball test should be completed in a suitable area, such as an edit suite that has a broadcast video monitor. If the programme has surround sound, it should be listened to using surround speakers. Headphones generally should not be used.

Producers should look out for any quality issues that make the programme look or sound worse than expected from a high quality broadcaster. Remember: small quality issues may be amplified in the transmission process by the time the viewer sees them.

It is the producer's name on the credits so it is very important to feel confident that the quality is good and that the finished programme is something to be proud of.

If any of the issues in the following table are noticed, they probably need to be discussed with the editor – **programmes may be rejected if they are not corrected.**

BEFORE THE PROGRAMME STARTS

Line Up (colour bars and tone) must start at 09:59:30:00 for 20 seconds. This must be followed by the clock or slate at 09:59:50:00. **The clock information is a last check in playout.** If any of the timecodes are wrong or the clock/slate information is not correct, it will cause concern for the playout director who may decide to use an alternative programme if they are unsure it is the correct programme. For full details please see the *DPP Technical Standards for Delivery to UK Broadcasters*, section 4.5:

www.digitalproductionpartnership.co.uk/downloads/standards .

PROBLEM	WHAT IT LOOKS LIKE
Incorrect formatting, start time or information on the Clock/Slate	**If moving – the clock** must be an analogue circular clock counting down in 1 sec intervals for at least 7 seconds - there must be no audio over the count down. The clock/slate **may** include details of the post production company. **It must include:** • Production Number • Series title and Programme title (as applicable) • Episode title/number (as applicable) • Version (Pre/post watershed etc. if necessary) • Part number (if applicable) **No technical information may be added, which includes programme duration.**
Programme start time	The first frame of the programme **must** be 10:00:00:00.

DURING THE PROGRAMME

Poor image quality harms the viewer's experience of the programme and distracts from the story or editorial message. It also damages the broadcaster's reputation for high quality, causing complaints. In some cases, it is editorially justified e.g. the first moon landing images look terrible, but they should not be excluded from a documentary about space exploration. Wherever possible only high quality material should be used.

PROBLEM	WHAT IT LOOKS LIKE	TECHNICAL NAME(S)
Square blocks are visible	Areas of the image especially on darker or high detail motion look like they have squares or blocks.	Blockiness (including compression artefacts)
Blurry focus	The picture is out of focus, making it blurry. The *point of attention* should be in focus, so this does not mean focus pulling or having shallow depth of field cannot be used.	Video out of focus

PROBLEM	WHAT IT LOOKS LIKE	TECHNICAL NAME(S)
Captions/ Credits wrong	Ensure captions and credits are correct, with the correct spelling and punctuation. Also check that they actually say what you expect! The audience picks up every one of these.	Captions/credits wrong
Wrong colours	Colours look wrong. Images, especially skin tones should look natural and be consistent.	Poor colour or grading
Text or captions too wide	Many domestic TVs still over-scan and cut the edges off the picture. All edit devices have caption-safe grids, so use them to ensure all text is in the safe area. This only applies to text that needs to be read – not to text in the background.	Text out of safe areas
Edges of image jump in and out	Black or coloured edges on one or more sides of the image caused either by the picture being too small or an old analogue video transfer.	Blanking errors (video frame size)
Black bars	Warning that images are below a given size. Includes pillar box or letter box images.	Black bars
Can't make out shapes or detail	There should not be a loss of detail in the light or dark areas of the image.	Crushed, burnt out or clipped images
Poor quality picture (converted images)	Poor processing of non-HD images can cause errors and picture quality loss when compared to the original version. A converted image or sequence should not look worse than the original version.	Poor video up scaling (up-conversion), archive and standards conversion
Fuzzy/grainy picture	Grainy or speckled pictures, reducing the definition. Can be caused when shooting in low light. The video will go blocky when broadcast. Grainy or 'speckled' images. Can also be caused by the image being 'pushed' in grading.	Video noise

PROBLEM	WHAT IT LOOKS LIKE	TECHNICAL NAME(S)
Aliasing	Straight edges look like they are moving or have 'ghost' double lines. Stills may have jagged edges or patterning. Zooming images can have rotating patterning.	Aliasing
Aspect ratio errors	The picture is stretched or squashed because it is too wide or too tall. (Usually this would be older 4:3 material stretched into a widescreen 16:9 format.)	Aspect ratio
Steps in colour or brightness level changes	Colour or brightness graduations should be smooth and not appear to happen in steps.	Contouring
Very short shots	Flash frames (single frame shots) can lead to accusations of 'subliminal advertising' and can be disturbing. Very short shots should be avoided.	Flash frames (short shots)
Uneven edges on stills	Stills taken from moving images can have stepped or fuzzy vertical or diagonal edges.	Non de-interlaced stills
Juddering movement	Juddering or jumping as things in the shot move, or as the camera moves.	Non-smooth motion
Juddering rollers or crawls	Rollers or crawls should have smooth motion and not be too fast to read on a 42" screen.	Progressive rollers
Black edges around people or objects	Black edges around objects and ghosting on transitions from dark to bright areas of the image. Darker or brighter lines rolling across the image.	Ringing, hum & other artefacts

PROBLEM	WHAT IT LOOKS LIKE	TECHNICAL NAME(S)
Square block in the picture that doesn't move	A camera pixel that is not working causes a small square block that does not change. It can look like dust behind the lens but it is always sharp edged.	Stuck pixels
Something happens during a mix/wipe or other effect	There should not normally be shot changes during transitions (mixes, wipes or other effects).	Transition errors

AFTER THE PROGRAMME

PROBLEM	WHAT IT LOOKS LIKE	TECHNICAL NAME(S)
Video ends right after the programme	The programme must have 5 seconds of still picture or video *after* the end of the programme. This allows the programme to be mixed out on playout if necessary.	Lack of freeze/fade at end

AUDIO PROBLEMS

Poor audio quality makes the programme harder to watch and understand, especially for those with a hearing impairment. Inaudible dialogue causes a lot of viewer complaints.

PROBLEM	WHAT IT SOUNDS LIKE	TECHNICAL NAME(S)
Humming or buzzing	Background electrical noise and other interference which should not be heard (e.g. from mobile phones, mains power hum, cable crackle).	Hum or buzz
Silence	Silence longer than 10 seconds with pictures or 5 seconds with black or a freeze frame should be specifically noted in the QC report and to the broadcaster.	Silence
Unclear speech	There are many complaints about unclear dialogue – remember the audience has not seen the programme many times during post and does not have a script to read!	Unclear audio (especially dialogue)

PROBLEM	WHAT IT SOUNDS LIKE	TECHNICAL NAME(S)
Background noise	Background noise that is too loud relative to dialogue. This includes added effects and added music – both of which are often perceived by members of the audience to be too loud.	Audio background noise and unwanted audio
Strange or odd noises	Clicks, pops or other noises are heard which should not be there. Clicks and other short 'sharp' audio noises can be very distracting.	Audio clicks
Lip sync	The sound does not match the movement of the mouth on speech.	AV sync (lip sync)
Quiet sound	Sections of audio, especially dialogue, should not be so low that the audience needs to turn up the volume during the programme.	Low level audio
Mono	Mono sound should be of an equal level on the left and right of a stereo programme (this does not apply to surround sound – see the DPP Technical Standards for surround mixing details).	Mono (not stereo)
Unclear sound	The sound is not clear; it sounds muddy, crackly, robotic or just like noise.	Audio processing artefacts
Sound comes from the wrong direction	A sound that should be on the left comes out of the right speaker, or vice versa. Alternatively, the wrong audio track is heard (e.g. M&E with no dialogue).	Audio channel layout
Dialogue sounds quieter than expected or has an odd quality	Sound, especially dialogue sound, has a 'Phasing' effect or changes level for no reason.	Phase coherence (surround sound)

3.2 Automated QC

Alongside the Producer Review or 'eyeball check', the file-based programme will be given an Automated Quality Control test. This is a software process which will analyse the file and make sure it meets the standards necessary. The producer should be asked to review the report and sign off any results, as the producer is the person ultimately responsible for delivering a programme which meets the technical requirements set out in the broadcaster's contract.

The AQC device will warn about a number of possible errors. These can be categorised against one of three 'Failure types' which indicate the required response to one of these errors appearing.

Mandatory tests must be passed to meet the basic delivery standards. If the programme fails on one of these tests, it **must be fixed** before delivery to the broadcaster. When working with a post production provider, production should ensure that these errors are fixed before delivering their programme.

Technical warnings should be **reviewed in an edit suite**, and fixed if at all possible. These problems may have a technical cause which can be fixed; if not, then production must warn the broadcaster about the problem.

Editorial warnings indicate problems which may harm viewers' enjoyment of your content. However, they may also be unavoidable; for example the footage of the moon landings may trigger a few of these warnings, but it is still editorially justified to include this footage in a documentary on space exploration. Production must **review these warnings in an edit suite** and if it is decided to accept them without fixing, the broadcaster must be warned.

The online/craft editor should be able to advise on how to fix many of these errors, and post production technical support will understand the most technical mandatory tests.

If there is a need to inform the broadcaster about a warning that is unavoidable, it may be possible to use the 'Video comments' and 'Audio comments' fields in tools such as the DPP Metadata Application. However, these may have a limited space, so these boxes can be used instead to point to the QC report for more details. Most AQC tools allow comments to be added into the report itself, which may be helpful to explain why a warning has not been fixed.

The following table describes the majority of possible errors picked up by AQC. Each one has been given a 'Failure type'.

TEST	DEFINITION	TESTING	FAILURE TYPE
File structure & codec details	A number of checks are performed on the structure of the file and the way that the audio and video are encoded. For example, are the audio and video the same length? Is the technical metadata valid? Is the video encoded in the right codec? And the audio? Is it the correct bit-rate and sample rate? The full list of checks is as follows: • AFD value • Audio bit depth • Audio channel count • Audio encoding format • Audio sample rate • Audio track duration matches metadata • Chroma sampling • Display frame size • Field order (file structure/metadata) • Frame rate • GOP structure • Mismatch in audio and video duration • Scanning (file structure/metadata) • Start timecode • Stored frame size • Video bit depth • Video encoding format • Video encoding profile • DPP shim metadata	File, Audio, Video	Mandatory

AUDIO

TEST	DEFINITION	TESTING	FAILURE TYPE
Audio clipping	Has the audio been clipped? This means it will sound distorted.	Audio	Editorial warning
Audio dropout	Are there dropouts (very brief periods of silence or near-silence) in the audio?	Audio	Editorial warning

TEST	DEFINITION	TESTING	FAILURE TYPE
Dialnorm to loudness mismatch	Measured loudness must match the loudness value listed in the metadata.	Audio	Technical warning
Audio phase error	This test will warn if the phase of stereo or surround channels are not the same. This can cause audio level changes, and in extreme cases, makes them cancel out so the audience don't hear it at all.	Audio	Mandatory
Programme loudness	Programme should comply with the R128 loudness standard. If it doesn't, you'll be warned. If the measured value and the metadata in your file say different things, you'll also be warned.	Audio	Mandatory
Maximum peak (audio) level (dBTP)	The system will make sure that the loudest audio isn't above the allowed levels.	Audio	Mandatory

VIDEO

TEST	DEFINITION	TESTING	FAILURE TYPE
Coloured frames (including black frames)	This test will give you a warning if there are black frames or coloured frames in your file, which may indicate a missing video or an encoding problem.	Video	Editorial warning
Field order (video artefacts from incorrect field order)	TV pictures are interlaced – each frame is made up of 2 fields. It is occasionally possible for the fields to appear in the wrong order, which causes unpleasant motion judder.	Video	Mandatory
Freeze frames	This test looks for freeze frames with no motion. This could be a graphic, so no need to worry about that! But it could be a problem in the file if the video was meant to be moving. (You only need to warn the broadcaster if freeze frames are longer than 5 seconds).	Video	Editorial warning

VIDEO (continued)

TEST	DEFINITION	TESTING	FAILURE TYPE
Video signal levels (including colour gamut)	TVs can only show a certain range of colours, called the 'gamut', and pictures must be within a certain brightness range. This test makes sure your video will pass through the broadcast chain unharmed. If you get an error, the video needs to be 'legalised'.	Video	Mandatory
Scanning (video artefacts from incorrect scanning mode)	The broadcast chain is interlaced, so your programme must be. If there is any progressive source material, it must have been converted to interlaced (progressive material stored in interlaced frames is called 'PSF').	Video	Technical warning
Video dropout	This test will look for small video dropouts, such as small black squares that might appear for a frame or two. They are most often caused by problematic ingest from digital tape formats.	Video	Technical warning
PSE	The AQC system, or sometimes a separate tool, will check for segments of video which may be harmful to sufferers of photosensitive epilepsy. This includes 3 tests, for luminance flashes, red flashes and spatial patterning. It is often known as the 'Harding test', because of the Harding FPA devices that were most often used for tape-based tests. However, many different file-based tests are available, and the DPP allows the use of a number of devices. An up-to-date list of acceptable devices is available on the DPP website. (See section 4.)	Video	Mandatory

The QC Report can be delivered using a separate PDF or XML file output from the QC tool. If using the DPP Metadata Application, there are 127 characters each for video and audio comments: these can be used to point to the QC report for more detailed comments if necessary.

The DPP would prefer PDF QC reports initially but would like to encourage the use of XML reports over time.

4

PSE CHECK

Photo Sensitive Epilepsy (PSE) affects one in four thousand people, with the age group of seven to twenty years olds five times more likely to be susceptible than the rest of the population. It is triggered by visual stimuli that overload the brain temporarily and cause a seizure. The triggers are commonly flashes or repeating changes between dark and light (such as stroboscopic effects or flash photography), some geometric patterns, and certain colours such as deeply saturated red.

Ofcom publishes guidance to TV broadcasters and producers on how to avoid causing PSE events, and analytical tools are available to test video images before transmission. Pioneering work led by Professor Graham Harding in the late 1990's developed the Flash Pattern Analysis (FPA) algorithm, which for many years was the de facto industry standard. This is now licensed to other manufacturers for inclusion in their Quality Control (QC) products and, in addition, alternative tools are now available on the market.

Photo Sensitive Epilepsy (PSE) testing is a requirement for all delivered programmes. The DPP Technical Standards mandate the PSE testing of file-based delivered programmes, together with a consistent approach to measurement. It also provides producers with a guide to available products that will automatically identify any PSE failures in file-based content that would require re-work before delivery to the broadcasters. This follows testing of many of the currently available devices from the various manufacturers.

The DPP published list contains products that competently perform PSE testing in the context of file-based QC. This list is not exhaustive, and will be updated as other products are made available and tested. It does not represent a DPP recommendation or endorsement. The product list is contained in *A Product Guide for File-Based Photo Sensitive Epilepsy Testing* available via:

www.digitalproductionpartnership.co.uk/downloads/standards .

The PSE check may be carried out as part of the QC checking, depending on the system used.
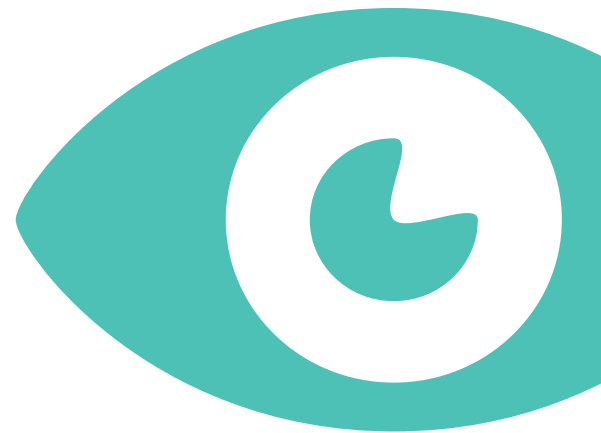
ADD DPP METADATA

In the tape world all technical and production information (metadata) was written on a Video Tape Recording Report and tucked inside the tape box. In a file world this metadata must be added to the file.

Some technical metadata (sometimes known as structural metadata) will be automatically added when the file is made. The remainder must be added manually.

Depending on your workflow some of the descriptive metadata can be partly entered in advance of the final edit and file creation process. Indeed, some of this information will be needed by your post production provider to put on the clock (see 'Before the programme starts' in the table in section 3.1.1). Alternatively it can all be entered afterwards using the latest version of the DPP Metadata Application

www.digitalproductionpartnership.co.uk/downloads/metadata-application/

or another third party tool.

Descriptive metadata includes
- Series Title
- Programme Title
- Identifier
- Synopsis
- Genre etc.

Technical metadata includes
- Video
- Time-codes
- Audio
- Access Services
- Additional (Completion date, Contact information etc.)

Many fields will have lists of allowed values which the user can select. If a value is not presented, it is generally because it is not an acceptable option.

Once completed, the descriptive and technical metadata will be wrapped with the video and audio into a new and final AS-11 DPP MXF file.

This must be done after all post production is complete and the programme is ready for delivery to the broadcaster, as any changes to the file are likely to invalidate the metadata and cause the file to be rejected. If *any* metadata needs to be altered this will involve re-wrapping the file.

It is the programme producer's responsibility to ensure that all metadata accurately relates to the finished programme in the file. Note particularly that synopses must be no more than 127 characters (including spaces).

For detailed information about using the DPP Metadata Application, please see the *Metadata Application User Guide* at

www.digitalproductionpartnership.co.uk/downloads/guides .

5.1 Required Fields

The table below gives an overview of the metadata required. The 'Mandatory' column indicates which fields must be entered before delivery of the file.

- The entries highlighted contain information provided to the producer/production company by the broadcaster (e.g. in their contract).

- Some fields may be automatically derived from the MXF file structure (by the DPP Metadata Application, for example). However, these should be checked by the user to ensure they match allowable values.

- The remaining fields should be entered by a programme producer or their technical representative.

FIELD NAME	ALLOWABLE VALUES IN **BOLD** EXAMPLES IN *ITALICS*	MANDATORY/ NOTES	ENTERED BY: PRODUCTION/FACILITY/ AUTOMATED
EDITORIAL			
Series Title	*Mad Dogs - Season 4 (2011)*	**Yes**	**Production**
Programme Title	*Use the series title if there is no separate programme title*	**Yes**	**Production**
Episode Title/Episode No	*Basset Hounds*	**Yes**	**Production**
Production Number	*DRIB111P/01*	**Yes**	**Production**
Synopsis	No more than 127 characters including spaces	**Yes**	**Production**
Originator	*ABC Productions*	**Yes**	**Production**
Copyright Year	**Year only, entered as yyyy**	**Yes**	**Production**
Other Identifier	Number IF provided and requested by the broadcaster.	No	**Production**

FIELD NAME	ALLOWABLE VALUES IN **BOLD** EXAMPLES IN *ITALICS*	MANDATORY/ NOTES	ENTERED BY: PRODUCTION/FACILITY/ AUTOMATED

EDITORIAL (continued)

FIELD NAME	ALLOWABLE VALUES IN **BOLD** EXAMPLES IN *ITALICS*	MANDATORY/ NOTES	ENTERED BY
Other Identifier Type	*ISAN / EIDR*	Conditional: mandatory if 'Other Identifier' is given	**Production**
Genre	*Comedy*	No	**Production**
Distributor	*Sony Pictures*	No	**Production**

TECHNICAL

FIELD NAME	ALLOWABLE VALUES	MANDATORY/ NOTES	ENTERED BY
Shim Name	**UK DPP HD** **UK DPP SD**	**Yes**	**Automated**
Shim Version	**1.1**	**Yes**	**Automated**

VIDEO

FIELD NAME	ALLOWABLE VALUES	MANDATORY/ NOTES	ENTERED BY
Video Bit Rate	**100 (For HD)** **50 (For SD)**	**Yes**	**Automated**
Video Codec	**AVCI (For HD)** **AVC-Intra (For HD)** **D10 (For SD)** **IMX (For SD)**	**Yes**	**Automated**
Video Codec Parameters	**High 4:2:2 level 4.1 (For HD)** **4:2:2 P@ML (For SD)**	**Yes**	**Automated**
Picture Format	**1080i 50 16:9 (For HD)** **576i 16:9 (For SD)** **576i 4:3 (For SD)**	**Yes**	**Automated**

FIELD NAME	ALLOWABLE VALUES IN **BOLD** EXAMPLES IN *ITALICS*	MANDATORY/ NOTES	ENTERED BY: PRODUCTION / FACILITY / AUTOMATED
VIDEO (continued)			
AFD	**9** **10** **14**	**Yes**	**Facility**
Picture Ratio	**4:3** **14:9** **15:9** **16:9** **16.65:9** **21:9** **21.6:9**	No	**Facility**
3D	**Yes/No**	**Yes**	**Facility**
3D Type	**Side by side** **Dual** **Left eye only** **Right eye only**	Conditional: mandatory if '3D' is '**Yes**'	**Facility**
Product Placement	**Yes/No**	No	**Production**
PSE Pass	**Yes** **No** (Broadcaster requires PSE pass) **Not tested** (Broadcaster requires PSE pass)	**Yes**	**Facility**
PSE Manufacturer		Conditional: mandatory if 'PSE Pass' is set to **Yes** or **No**.	**Facility**
PSE Version		Conditional: mandatory if 'PSE Pass' is set to **Yes** or **No**.	**Facility**
Video Comments		No	**Facility** (if any comments)

FIELD NAME	ALLOWABLE VALUES IN **BOLD** EXAMPLES IN *ITALICS*	MANDATORY/ NOTES	ENTERED BY: PRODUCTION / FACILITY / AUTOMATED
AUDIO			
Audio Sampling Frequency	**48**	Yes	**Automated**
Audio Bit Depth	**24**	Yes	**Automated**
Audio Codec Parameters	**PCM (For HD)** **AES3 (For SD)**	Yes	**Automated**
Audio Track Layout	**R 48: 2a (4 ch. Only)** **R 123: 4b (4 ch. Only)** **R 123: 4c (4 ch. Only)** **R 123: 16c (16 ch. Only)** **R 123: 16d (16 ch. Only)** **R 123: 16f (16 ch. Only)**	Yes	**Facility**
Primary Audio Language	*zxx* (none), *eng*, *ita*, *wel*, etc.	Yes	**Facility**
Secondary Audio Language	*zxx* (none), *eng*, *ita*, *wel*, etc.	Yes	**Facility**
Tertiary Audio Language	*zxx* (none), *eng*, *ita*, *wel*, etc.	Yes	**Facility**
Compliant Audio Standard	**EBU R128** **None** (Broadcaster requires EBU R128)	Yes	**Facility**
Audio Comments		No	**Facility** (if any comments)
TIMECODES			
Line-up Start	**09:58:00:00** - for SD files (legacy programmes only) **09:59:30:00**	Yes	**Facility**
Ident Clock Start	**09:59:30:00** - for SD files (legacy programmes only) *(if L/U start is 09:58:00:00)* **09:59:50:00** *(if L/U start is 09:59:30:00)*	Yes	**Facility**

FIELD NAME	ALLOWABLE VALUES IN **BOLD** EXAMPLES IN *ITALICS*	MANDATORY/ NOTES	ENTERED BY: PRODUCTION/FACILITY/ AUTOMATED
TIMECODES (continued)			
Repeating Group: TC			
Part Number	*1, 2, 3*	**Yes**	**Facility**
Part Total	*1, 3, 6*	**Yes**	**Facility**
Part SOM	**10:00:00:00** (for First part)	**Yes**	**Facility**
Part Duration	*00:08:22:00*	**Yes**	**Facility**
End of Repeating Group: TC			
Total Number of Parts	*1,3*	**Yes**	**Facility**
Total Programme Duration	*00:57:22:00*	**Yes**	**Facility**
ACCESS SERVICES			
Audio Description Present	**Yes/No**	**Yes**	**Facility**
Audio Description Type	**Control data / Narration AD Mix**	Conditional: mandatory if 'Audio Description Present' is **Yes**	**Facility** (if required)
Closed Captions Present	**Yes/No**	**Yes**	**Facility**
Closed Captions Type	**Hard of Hearing/Translation**	Conditional: mandatory if 'Closed Captions Present' is **Yes**	**Facility** (if required)

FIELD NAME	ALLOWABLE VALUES IN **BOLD** EXAMPLES IN *ITALICS*	MANDATORY/ NOTES	ENTERED BY: PRODUCTION / FACILITY / AUTOMATED
ACCESS SERVICES (continued)			
Closed Captions Language	*eng*, *ita*, *wel*, etc.	Conditional: mandatory if 'Closed Captions Present' is **Yes**	**Facility** (if required)
Open Captions Present	**Yes / No**	**Yes**	**Facility**
Open Captions Type	**Hard of Hearing / Translation**	Conditional: mandatory if 'Open Captions Present' is **Yes**.	**Facility** (if required)
Open Captions Language		Conditional: mandatory if 'Open Captions Present' is **Yes**.	**Facility** (if required)
Signing Present	**Yes / No / Signer only**	**Yes**	**Facility**
Sign Language	**BSL (British Sign Language) / BSL (Makaton)**	Conditional: mandatory if 'Signing Present' is **Yes** or **Signer only**.	**Facility** (if required)
ADDITIONAL			
Completion Date	**yyyy-mm-dd**	**Yes**	**Facility**
Textless Elements Exist	**Yes/No**	No	**Facility**

FIELD NAME	ALLOWABLE VALUES IN **BOLD** EXAMPLES IN *ITALICS*	MANDATORY/ NOTES	ENTERED BY: PRODUCTION / FACILITY / AUTOMATED

ADDITIONAL (continued)

Programme Has Text	**Yes/No**	No	**Facility**
Programme Text Language	*eng, ita, wel* etc.	Conditional: mandatory if 'Programme Has Text' is **Yes**	**Facility**

CONTACT INFORMATION

Contact Email	The contact email for the person in the company responsible for delivering the completed commission.	**Yes**	**Production**
Contact Telephone No.	The contact telephone number for the person in the company responsible for delivering the completed commission.	**Yes**	**Production**

DELIVERY OF PROGRAMME FILE

6.1 File Transfer over a secure managed network service and leased line

The preferred method of delivery will usually be by using a 3rd party UDP accelerator such as Aspera, Signiant or File Catalyst, but transfer agents are not limited to these types. Transfer may optionally be over a managed network, private leased line or the internet. The transfers are managed by the relevant 3rd party applications, and vary in scale and complexity. A service may be available from your broadcaster at low or no cost. This will depend on a number of factors, including your available connectivity and the licensing arrangements currently in place so please liaise with your broadcaster.

The leased line or circuit should have a sufficient speed to enable programme file delivery reliably and in an acceptable time. It is normal to expect transfer agents to provide a confirmation that the files have been successfully delivered, and file integrity verification should therefore be included in any file transfer process.

To allow a smooth introduction to file-based delivery, it may be possible to submit a test sample file to the broadcaster and have a subset of checks made to ensure that the basic structure meets the DPP Technical Standards. This service may be offered on a best endeavours basis, with the aim of ironing out initial issues in the transition to file delivery.

6.2 File Transfer using sFTP or FTPs

Secure file delivery over 3rd party networks using secure FTP. As above the connection speed should be sufficient to enable programme file delivery in an acceptable time.

It is very unlikely that delivery over the internet directly would be acceptable, due to the latency and connection speed being inadequate for the large DPP programme file sizes.

The type of transfer mechanism using sFTP should be approved by the broadcaster in advance.

6.3 Hard Disk

Portable hard disk units containing one or more programme MXF files. Hard disks will normally require some form of content protection, using either hardware or software encryption. The type of hard disk chosen should have a high-speed data interface such as USB3 or Thunderbolt, and agreed disk format, such as NTFS, FATX or HFS+. The use of hard disks rather than the file transfer mechanisms above will need to be approved by the broadcaster in advance, as well as the type of interface, disk format, and encryption.

If it has been agreed with the broadcaster to use hard drive physical media, the same delivery address and details should be used, as with existing videotape deliveries.

6.4 LTO Tape

The use of LTO data tapes rather than the file transfer mechanisms above will need to be approved by the broadcaster in advance.

If a broadcaster has approved the use of LTO data tapes it should be LTO 5 Data Tape recorded using the LTFS (Linear Tape File System) format containing the programme MXF file. An LTO tape may contain multiple, separate programme files.

PRODUCTION CHECKLIST

Once all the information in this handbook has been considered, producers should be able to complete the following checklist for programmes to be delivered on file.

1	Is the craft video editing complete and signed off?	☐
2	Is the video technically legal (has it been 'legalised')? Check with post production provider.	☐
3	Has the audio been mixed to EBU R128? Check with post production provider.	☐
4	Is the audio mastering and dubbing signed off?	☐
5	Does the MXF file produced meet the DPP Technical Standards (AS-11 DPP)?	☐
6	Has an automated QC check been carried out, and has it a pass certificate?	☐
7	Has a PSE check been carried out, and has it a pass certificate?	☐
8	Has an 'eyeball' check been carried out by the producer, and have warnings been corrected and/or reported to the broadcaster?	☐
9	Has the broadcaster provided the production company with 'broadcaster provided metadata'?	☐
10	Has the production team prepared all required DPP metadata (programme information) and passed this on to the post production provider?	☐
11	Does the post production provider have all the metadata they require for inclusion in the file?	☐
12	Has the DPP descriptive and technical metadata been added to the file? (post production provider to confirm)	☐
13	Has the file been delivered using a verification method? (Such as Aspera, Signiant or some other transfer with verification – post production provider to confirm)	☐
14	Has the PSE pass certificate been delivered? (A pass/fail indicator is part of the technical file metadata.)	☐
15	Has the QC report been delivered?	☐

ACKNOWLEDGEMENTS