



STANDARDS QUARTERLY REPORT June 2024

Result of SMPTE[®] Technology Committee
Meetings (Hybrid, In-Person/Online)

Hosted by Ross Video STEM COMPLEX of
University of Ottawa (Ottawa/Canada)
4th to 6th of June 2024

THE NEXT CENTURY

SMPTE® Standards Quarterly Report

This report comprises an Executive Summary followed by a [detailed description](#) of this round of Technical Committee meetings:

*SMPTE Standards Committee Meetings 4-6 June 2024
Host: Ross Video STEM Complex of University of Ottawa, CA*

Executive Summary

This Executive Summary lists new project proposals this quarter and provides a high-level view of project developments. More information on the status of the active projects can be found in the [detailed description](#) that follows this summary.

Seven SMPTE Technology Committees (TCs) scheduled meetings at this round (the subgroups mostly develop their projects by telecons).

There were 100 registrations for attendance over the three days as follows:

- All meeting and Ross Video tour days (4-6 June), in person: 18
- Wednesday (5 June) only, in person: 1
- All meeting days (4-5 June), virtual: 66
- Tuesday (4 June) only, virtual: 10
- Wednesday (5 June) only, virtual: 5

Documents published in the last quarter from the work of each TC are listed on [this page](#).

<i>Proposals for new SMPTE projects submitted in the last quarter</i>			
Project Name	Type	Technology Committee	Approval Period Ends
Sustainability in Media	New Engineering Report	Standards Committee	2024-06-11
Signal Sync alternate mode over USB-C	New Standard	Network, Facilities Architecture	2024-05-29
ST 2067-4 – IMF Virtual Track Fingerprint	New Standard	Media Packaging	2024-05-13
Catena Interface	New Standard	Media Systems	2024-03-29
D-Cinema Origins Study Group Final Report Archival Effort	Reconstructed report	Cinema	2024-03-21

Professional Media over IP Projects

Professional Media over Managed IP Networks

This project group developed the ST 2110 suite that standardizes an interoperable system for media IP networks to transport separate video, audio, and associated data streams. [Details](#)

Twelve parts of the suite are published, including recent revisions. There is also an application document for the fast metadata transport for audio metadata.

There is also a part in development on Timing Planes for 2110 Streams

There are projects creating ST 2110 Protocol Implementation Conformance Statements (PICS) for most of the SMPTE 2110 suite documents. [Details](#)

Network-Based Synchronization for the Professional Media Environment

The ST 2059 suite defines a synchronization system for media using precision time protocol (PTP) packets on an IT network. There are ongoing projects in support of this technology:

- The group that has organized ST 2059 “plugfests” has expanded its scope to write “best practices” documents. [Details](#).
- A revision of ST 2059-2 is being developed to reference - and harmonize with - the latest revision of the IEEE PTP standard. [Details](#)

Required Application Protocol Standards for IP-Based Media Production

A study group in the Media Systems, Control and Services TC has researched standards requirements for interoperability of production applications based on a capability view and a workflow analysis. Its report has been reviewed and awaits finalization. [Details](#)

Interoperable Master Format (IMF)

IMF is a file-based framework designed to support multiple high-quality content versions of a finished work destined for distribution channels worldwide. The suite currently comprises 21 published SMPTE Documents - [Details](#).

There is work on IMF Output Profile List standards – a revision and 3 new standards. [Details](#)

There is new work on several IMF topics; new Application documents, Audio with Metadata, Auxiliary Image Sequence, Event based Metadata, Virtual Track fingerprint. [Details](#)

SMPTE Video Compression Standards

SMPTE has standardized six video compression standards – VC-1 to VC-6.

Work on video compression standards is nearing completion:

- A VC-6 mapping into MXF is underway. There is also an IMF application underway [MXF](#) [IMF](#)
- A suite of documents defining the VC-5 compression system is complete, though [minor revision](#) is taking place. An IMF Application is underway. [Details](#).
- Projects to revise SMPTE VC-3 documents to add Alpha channel. The essence document is complete and an MXF mapping has just been completed. An IMF mapping is underway – [IMF](#)

Cinema Projects

IMF, above, is also highly relevant to the Cinema community

The Cinema Group (27C) is handling the following work

Document Maintenance

This Working Group looks after the maintenance of all TC published documents. [Details](#)

Cinema Sound Systems

This Working Group deals with improving the quality of sound in cinema presentations, through the standardization of technical practices from content creation dubbing stages to commercial outlets.

The TC has a working group on B-Chain Characteristics and Expectations, with drafting groups studying:

- Research on relevant Technical Documents
- In-situ Measurements and Testing

[Details](#)

Digital Cinema (D-Cinema)

This Group has published four large multi-part document suites dealing with these topics:

- D-Cinema Distribution Master
- D-Cinema Packaging
- D-Cinema Operations
- D-Cinema Quality

Current projects include:

- Minimal Timed Text XML Requirements
- Japanese Subtitle Mastering
- Exhibition Display
- Digital Cinema Distribution Master - Packed Image

[Details](#)

DPX Projects (in the file systems TC)

The HDR DPX standard was published in Q1 2019. There is ongoing work. [Details](#)

There is a new standard in development on Mapping DPX Picture Sequences into the MXF Generic Container. [Details](#)

Material Exchange Format – MXF

This widely-used file-based media format continues to develop with projects adding features and mappings to the MXF suite of standards or creating constraints for improved interoperability in a variety of application areas. There are currently 8 MXF-related projects in process. [Details](#)

They comprise:

- RP 2057 - Text-based metadata carriage in MXF (revision)
- Mapping VC-6 into the MXF Generic Container
- Mapping VC-5 into the MXF Generic Container
- Mapping Audio Definition Model to MXF
- Mapping DPX files into the MXF Generic Container
- MXF Mappings for VI Lines and Ancillary Data Packets (revision)
- Extensible Time Label (TLX) KLV Encoding and MXF Mapping
- Descriptive Metadata Scheme for Compatible Time Labels

Media Microservices

This group has a project in the public Committee Draft stage - IMF Registration Service API. Its Status Reporting and Logging document has just completed ballot. There is a Job Processing Architecture document in development and a new suite of documents for the Catena control interface.

Future work is being developed in RIS-OSA. [Details](#)

Extensible Time Label (TLX)

This group has developed a **Standard** suite for a time label that overcomes the shortcomings of SMPTE ST 12 (support for today's higher frame rates, time values greater than 24 hours) as well as supporting additional requirements of current systems and workflows such as a "Digital Birth Certificate" including a Source Ident. The 3 TLX documents were posted for a Public CD period and have passed FCD ballot. Two documents to define KLV Encoding and MXF Mapping for TLX are underway. [Details](#)

Metadata and Registers

This TC (and its predecessor) has been maintaining metadata ULs on behalf of other SMPTE TCs and industry organizations for the last 20+ years. Its systems were upgraded to use xml rather than spreadsheets and an additional register was standardized for Essence elements keys. It has tools available to check the integrity of requests for new ULs. [Details](#)



AI and ML in Media

A joint task force with the Entertainment Technology Center is studying this topic and its report, ER 1010, is now published [here](#)). It continues to meet to consider standardization requirements.

Other Projects

A very large number of SMPTE Standards projects are active – too many to cover in an executive summary even though they may be important to implementers. SMPTE has a searchable publicly available [project summary page](#) that should help locate topics of interest that can then be followed up in the main body of this report.

SMPTE® Standards Quarterly Report

Detailed Account

*SMPTE Standards Committee Meetings 4-6 June 2024
Host: Ross Video STEM Complex of University of Ottawa, CA*

SMPTE® is a global leader in motion-imaging technology standards and education for the communications, media and entertainment industries – and the only organization to connect the areas of motion-imaging research, standardization, education, and business success. This report is a snapshot in time and should not be regarded as formal minutes, a positioning statement or an analysis piece.

If you are interested in learning more about the SMPTE Standards program, or would like to submit comments, please see [this website page](#) or contact the [Director of Standards Development](#)

Introduction

The quarterly SMPTE Standards meeting rounds are led by the SMPTE Standards VP, a volunteer post, and the SMPTE Director of Standards Development, a staff post. These posts are currently filled by Sally Hattori and Thomas Bause Mason respectively.

There are six Standards Directors, currently Pierre Lemieux, Thomas Kernan, Florian Schleich, Steve Llamb, Dean Bullock, Raymond Yeung.

Each round comprises meetings of Technology Committees (detail in the sections below) as well as any subgroups whose work requires face-to-face meetings. Subgroup work also proceeds continuously between the quarterly meetings using teleconferences.

If you need some help getting started with the SMPTE Standards process and some of the conventions / acronyms used in this report, please take a look at the [Annex](#).

Future Meetings

Quarterly Standards meeting rounds are planned for:

- Q3 2024 18-20 September, Geneva, CH
- Q4 2024 9-12 December Online
- Q1 2025 3-6 March Online
- Q2 2025 June; hybrid in Asia, TBC

This Quarterly Report provides a detailed account of the meetings of the following SMPTE Standards TCs and their sub-groups:

[Essence \(10E\)](#)

[Cinema \(27C\)](#)

[Metadata and Registers \(30MR\)](#)

[File Formats and Systems \(31FS\)](#)

[Network and Facilities Architecture \(32NF\)](#)

[Media Systems, Control and Services \(34CS\)](#)

[Media Packaging and Interchange \(35PM\)](#)

Links to each TC report section are also provided in the footer of each page to assist with navigation. Documents published in the last quarter from the work of each TC are listed on [this page](#).

In addition to the TC meetings, there were:

- A Standards Community meeting that covered:
 - o The standards publishing process
 - o AI in media
 - o A new “sustainability in media” study group
 - o Future meetings schedule
- A presentation from the university of Ottawa on cyber security training
- A visit to a school using virtual production
- A visit to the Ross Video R&D labs

The SMPTE website now has a [summary projects page](#) publicly available.

Details from each Technology Committee (TC) meeting

Essence Technology Committee (TC-10E) Chair: Fred Walls

The application of the General Scope as it applies to electronic capture, generation, editing, mastering, archiving, and reproduction of image, audio, subtitles, captions, and any other master elements required for distribution across multiple applications

DG: Common LUT Format

The Common LUT Format (CLF) can communicate an arbitrary chain of color operators (also called processing nodes) which are sequentially processed to achieve an end result.

The work will be based on an existing CLF specification developed by the Academy (AMPAS), available at <https://docs.acescentral.com/specifications/clf>

Current project:

ST xxxx: Common LUT Format

Status: The DG has held 3 meetings in the last quarter; the next meeting will be 2024-06-11. A draft standard and xml schema are available in the DG. There is discussion about profiles supporting live broadcast workflows.

DG: Measurement Methods for Resolution Characteristics of Camera Systems

Current project:

RP 2130 - Measurement Methods for Resolution Characteristics of Camera Systems

To facilitate the maintenance and operation of studio equipment, the purpose of this project is to document measurement methods for the spatial resolution characteristics of camera systems. Specifically, to measure the Modulation Transfer Function (MTF).

Status: The DG Chair reported that the group is making progress.

DG: SMPTE 2080 Document Suite - Reference Display and Environment for Critical Viewing of Television Pictures

This group has a suite of documents dealing with the use of fixed pixel matrix reference displays.

Published documents:

ST 2080-1: Reference White Luminance Level and Chromaticity (one-year review due)

RP 2080-2: Measurement and Calibration Procedure for HDTV Displays (deals with parameters that can be regularly adjusted)

ST 2080-3: Reference Viewing Environment Characteristics

Current projects:

RP 2080-4 - Measurement Procedures for Characterization of HDTV Displays

Defines the procedures, conditions and rules applicable for measuring the parameters of an HDTV Reference Display.

Status: The DG Chair reported that he is now able to return to this work and will decide the best way forward.

RP 2080-2: Measurement and Calibration Procedure for HDTV Displays

During development of RP 2080-4, errors in the line numbers of the test patterns in RP 2080-2 were noticed. The patterns also need to be modified to add copyright notices and define risetimes. The specified alternate white point for certain regions (9300K) should be changed to D93 and the x,y coordinates changed.

Status: The 2080-4 work will take priority.

DG: IPT-PQ

Prior to standardization of color representation ICtCp in ITU-R BT.2100, an alternative – IPT-PQ - was used by many major OTT distributors. It is important to these OTT distributors that these assets are labeled as utilizing the IPT-PQ color representation in two variants (scope now modified to only cover IPT-PQ-C2 and not IPT-PQ-C0), and that the characteristics are standardized.

Current project:

ST 2128 - IPT-PQ color representation.

Status: A DG member took an action item to send a package for pre-DP review to the TC Chair.

Revision: SMPTE 2046 Suite

Published Documents:

ST 2046-1:2009 - Specifications for Safe Action and Safe Title Areas for Television

RP 2046-2:2009 - Safe Areas for Protection of Alternate Aspect Ratios

EG 2046-3:2010 - Safe Areas for Television

Current projects:

ST 2046-1 - Specifications for Safe Action and Safe Title Areas for Television

Add Safe areas for UHD image formats. Update normative references.

RP 2046-2 - Safe Areas for Protection of Alternate Aspect Ratios

Add Safe areas for UHD image formats. Update normative references.

Status: The DG Chair is now able to return to this work. It was previously reported that UHD formats have been added to both documents.

DG: SMPTE 2073 Document Suite: VC-5 Video Essence

This group standardizes the CineForm / GoPro video compression system.

Published documents:

ST 2073-1 - VC-5 Elementary Bitstream

RP 2073-2 - VC-5 Conformance Specification

ST 2073-3 - VC-5 Image Formats

ST 2073-4 - VC-5 Subsampled Color Difference Components

ST 2073-5 - VC-5 Layers (this allows embedding multiple images in a single bitstream; used for stereoscopic, HDR and interlaced frames)

ST 2073-6 - VC-5 Sections

ST 2073-7 - VC-5 Metadata

ST 2073-10 - VC-5 Mapping into the MXF Generic Container – this was work in TC-31FS

Status: Test materials are available at a new GitHub [repo](#). This link has now been added to the published RP 2073-2 document.

Possible future projects dealing with alternative codebooks, lossless encoding and block-based encoding were described. A VC-5 codec website (not part of SMPTE) is available at <https://vc5codec.org>

An IMF application is underway in [TC-35PM](#). There is a [project](#) to revise ST 2073-10, the MXF wrapper, in TC-31FS.

Revision: ST 96:2004 Scanned Image Area

Update to current practices for diagrams, graphics, file formats, and conformance language. In particular, SVG graphics are needed instead of the current low-resolution images.

Status: There has been no progress in the last quarter. The document will be developed in HTML format.

Image Line Numbering

This will be a new document, probably an Engineering Guideline, explaining SMPTE practice for line numbering for video formats. In analog standards, the first line was numbered 1. In digital standards, the first line was numbered 0.

Status: The DG Chair will reformat the draft to use the html document development process.

Measurement of Video Display Reflectance

The text will be extracted from the present ST 2080-4 draft.

RP xxxx: Measurement of Video Display Reflectance

Status: This work will restart if there is sufficient support.

ST 2016 Suite on Active Format Description

Published Documents:

ST 2016-1 - Format for Active Format Description and Bar Data

ST 2016-2 - Format for Pan-Scan Information

ST 2016-3 - Vertical Ancillary Data Mapping of Active Format Description and Bar Data

ST 2016-4 - Vertical Ancillary Data Mapping of Pan-Scan Information

ST 2016-5 - KLV Coding for Active Format Description, Bar Data and Pan-Scan Information (document withdrawn)

Current Projects:

ST 2016-1 - Format for Active Format Description and Bar Data

Add UHD formats to ST 2016-1

Status: This work will restart; it is thought that most of the revision has been done.

Revision of ST 2048 suite

These are routine revisions arising from 5-year review. Part 1 will have an amendment rolled-up. All parts will have their Normative References updated. The “road-map” figure will be replaced with bibliographic reference to the EG 2111 suite.

Status: FCD ballot for all three parts closed 2024-01-12. Parts 2 and 3 had no comments and are automatically elevated to DP status. Part 1 has 11 editorial comments, plus several related to older style and template. These comments have been resolved and Part 1 should move forward to pre-DP-vote review shortly.

Revision: ST 2048-1:2011 2048 × 1080 and 4096 × 2160 Digital Cinematography Production Image Formats FS/709

Revision: ST 2048-2:2011 2048 × 1080 Digital Cinematography Production Image FS/709 Formatting for Serial Digital Interface

Revision: ST 2048-3:2012 - SMPTE Standard - 4096×2160 Digital Cinematography Production Image Formats FS/709 — Mapping into Multi-link 10 Gb/s Serial Signal/Data Interface

Other TC-10E business

At the last meeting, a presentation was given on Supplemental Data for Diffuse/Reference White. This work is expected to be a new TC-10E project, possibly as a revision of ST 2086.

Cinema Technology Committee (TC-27C) Chairs: Steve LLamb and C J Flynn

The application of the general scope as it applies to theatrical distribution, reproduction and operations, both analog and digital.

WG: Document Maintenance (WG27C-10)

General document maintenance, document issue tracking, 1-year & 5-year reviews of documents, project proposals for revisions/amendments as required.

Status: A large number of document revisions from this group have been published:

ST 429-2, ST 429-3, ST 429-4, ST 429-5, ST 429-6, ST 429-10, ST 429-14, ST 429-16, ST 429-18, ST 429-19, ST 430-1, ST 430-5, ST 430-12. Another 23 documents are in the queue for attention.

Revision RP200:2012 - Relative and Absolute Sound Pressure Levels for Motion-Picture Multichannel Sound Systems — Applicable for Analog Photographic Film Audio, Digital Photographic Film Audio and D-Cinema

Revision to include Immersive Audio – to Include D-Cinema immersive audio objects and bed channels in an unambiguous manner. This practice specifies a measurement method and wideband sound pressure levels for motion-picture dubbing theatres, review rooms, and indoor theaters using steady state wideband pink noise methodology, aligned with ST 2095-1. Together with SMPTE ST 202, it is intended to assist in standardization of reproduction of motion-picture sound in such rooms.

Status: There have been several meetings in the last month. The Chair reports that there has been a great deal of delicate weaving required to incorporate the specifics of the many variations of sound system implementations from the last several decades of cinema technology evolution while retaining compatibility with legacy.

SG: D-Cinema Study Group Final Report Archival Effort

Researchers of media and technology history need widely accessible primary source documents to reference in order to accurately recreate milestones in technology and to utilize them in the consideration of future requirements.

There was no published Final Report of the Digital Cinema Study Group, or any collected components of the work of the sub-committees, which should be available for reference and historical significance.

Status: The first meeting of the group is scheduled for 2024-06-06.

WG: Sound (WG27C-20)

Current WG project:

RP xxxx – B Chain Characteristics and Expectations

The Working Group output will be a Recommended Practice derived from the results of DGs efforts (see below). There is consideration of producing an Engineering Guideline as well.

The Drafting Groups are:

DG: In-situ Measurements and Testing

Re-Examine the system parameters that need to be measured and develop new and easily accessible measurement techniques (emphasis on repeatability).

Status: Sub-Teams have been meeting on topics for development of Objective Metrics. The following teams have been set up:

- *Coherence and linearity team*
- *Coverage, level, consistency, timbre team*
- *Dialogue intelligibility team*

Other topics have been identified

DG: Technical Documents Research

DG is tasked with researching existing documents, standards and research papers pertaining to sound system performance and measurements – with the goal inherent within all DGs - of correlating Perception and Measurement with the potential of modern computers and algorithms.

Status: The group has been on hiatus, as lead drivers have been working on other B-Chain projects.

SG: Exhibition Display

The study group shall investigate the needs and wants of the various concerned parties – e.g., DCI, Exhibitors, Manufacturers, Distribution Partners, Installers, QC Testers.

It will investigate Projection and LED displays that now reach into the ITU-R Rec BT.2020 color space and use ITU-R Rec BT.2100 transfer functions, and the implications of their use in various combinations in current and future infrastructures.

Status: One section of the report is still in the writing stage.

Current Document:

Engineering Report

The report will identify existing SMPTE documents that will need revision to include the new capabilities. It will recommend any further work to plug gaps.

DG: Stereoscopic Subtitling

Note: this DG also looks after non-stereoscopic subtitle projects.

Current Projects:

EG 428-23 Mastering Guideline for Japanese Timed Text DCDM

Creation of a guideline document for XML DCDM mastering of Japanese Timed Text to achieve desired results in current ST 428-7 renderers.

Status: EG 428-23 is now at PCD [here](#), ending no earlier than 2024-04-10 and no later than 2024-10-10. Update work is underway on comments received.

RP 428-22 D-Cinema Distribution Master – Minimal Timed Text XML Requirements

A new recommended practice to create a “blank” ST 428-7 DCDM Subtitle file (Minimal Timed Text XML Requirements).

Status: A comment was received during pre-DP-ballot review; work is ongoing.

DG: DCDM Packed Image (pDCDM)

Digital Cinema Distribution Master (DCDM) image essence is regularly exchanged between post-production facilities, typically using the constrained TIFF files specified at SMPTE RP 428-5. Such exchange is time-consuming and costly because of the size of these files – on the order of 10 TB for a motion picture.

ST 428-24 D-Cinema Distribution Master — Packed Image (pDCDM)

This document specifies a mapping of DCDM images, as specified in SMPTE ST 428-1, into mathematically lossless JPEG 2000 codestreams, each called a packed image.

Status: In public CD [here](#) ending no later than 2024-06-28. An FCD ballot will be requested at the end of the meeting week.

Metadata and Registers Committee (30MR) Chairs: Bill Redmann and Dean Bullock

The application of the General Scope as it applies to the definition and implementation of the SMPTE Registration Authority, used to identify digital assets and associated metadata such as the definition of shared metadata semantics across multiple committees.

UMID Projects

The Chair of the following projects gave a status report.

SG: Application of the Unique Material Identifier (UMID)

The UMID is standardized in ST 330. RP 205 covers application of UMIDs in Production and Broadcast Environments. This SG studied ways to make the UMID more useful, resulting in a report available [here](#). The SG remains open for assistance to the other UMID project groups and to review any new work items.

Status: The SG does not have any active work.

DG: UMID-related Standards

This DG is managing the following project:

Revision RP 205 – UMID Applications

This project will produce an updated version of RP 205 after its 1-year review and taking account of the most recent ST 330 update.

Status: The RP 205 revision has passed ST Audit and will be prepared for publication.

SG: UUID File Naming

This project will explore ways to unify the application of UUIDs to files, primarily as file names, but respecting whatever UUIDs already have been assigned to files.

Status: The SG continues to hold bi-weekly telecons – next meeting 2024-06-09. Work on the draft report is continuing.

DG: ST 331:2011 Amendment 1:2023 SMPTE Standard - Element and Metadata Definitions for the SDTI-CP

This project will Increase resolution and/or rate of creation date/time stamps

Status: The revision is published, and the project is closed.

WG 30MR10: Metadata Definition

This Working Group co-ordinates the process for adding or maintaining metadata items in registers. Registers are maintained and balloted in xml format. An online tool has been introduced to assist with the development of metadata entries and their validation and acceptance for batched ballots. The document is ST 2123 - SMPTE Metadata Registers. It contains a prose document and elements containing the individual registers in xml form. Requests for changes to the registers are processed and collected into batches for balloting. The current ST 2123 register release is available online [here](#).

Published Documents:

ST 335:2012 - SMPTE Standard - Metadata Element Dictionary Structure and Amendment 1 2019

ST 395:2014 - SMPTE Standard - Metadata Groups Register

ST 400:2012 - SMPTE Standard - SMPTE Labels Structure

ST 2003:2012 - SMPTE Standard - Types Dictionary Structure

ST 2088:2019 - SMPTE Standard - Essence Element Key Register Structure

ST 2123:2023-04 - SMPTE Standard - SMPTE Metadata Registers (“Vindaloo” release)

The Metadata Registers are publicly available here: <https://registry.smpte-ra.org/pages/>

Current projects:**Revision ST 2123 SMPTE Metadata Registers**

Adding requested Universal Labels to the registers that comprise ST 2123 - SMPTE Metadata Registers.

Status: The ST 2123 “Jalapeno” release was published, and the xml registers released [here](#) on SMPTE-RA 2024-05-27.

The next release “Balsamico” is open until 2024-06-10, when it will be prepared for ballot.

There are WG projects to revise and simplify existing metadata Standards in line with [administrative guideline AG18](#) that defines the process for adding new UL definitions to the metadata registers.

Revision ST 335 Metadata Element Dictionary Structure

Normalize to AG18

Revision ST 395 Metadata Groups Register Structure

Normalize to AG18

Revision ST 400 SMPTE Labels Structure

Normalize to AG18

Revision ST 2003 Types Dictionary Structure

Normalize to AG18



Status: ST 335 FCD ballot passed 2022-07-18 with no comments and the document was automatically elevated to DP status. ST Audit is held, pending revision of the other three documents. Those three have had additional change details added to their Foreword section (in response to pre-FCD-ballot comments). FCD ballots for these three documents will be initiated shortly.

File Formats and Systems Committee (31FS) Chair: Wolfgang Ruppel

The application of the General Scope as it applies to definition of common wrapper and file structures for storage, transmission, and use in the carriage of all forms of digital content components.

Material Exchange Format (MXF)

MXF defines a file format for Video, Audio and Data essence along with associated Metadata, for use in production systems (rather than final delivery).

There are several MXF projects under way. Some define new MXF features / applications, others revise existing documents for better interoperability.

Business Impact of all MXF-related work items: Interoperability between systems in file-based production

Revision: ST 380 - MXF Descriptive Metadata Scheme 1

Revise as part of the 5-year review in coordination with the revision of EG42. In addition, ensure that the labels in ST 380 are consistent with the new 30MR xml representations. References to RP 210 and RP 224 will be replaced with references to online xml registers and the ST 377-1 reference will be updated. Some minor typos will be fixed and boilerplate updated. Note: similar updates to EG 42 are proposed.

Status: There was a vote to reaffirm and stabilize ST 380 at the last meeting, so this project has been closed.

Revision: RP 2057 - Text-based metadata carriage in MXF

This is a constrained revision to roll-up an amendment and check Normative References. However, the document is also being revised in line with AG24 – MXF Style Guide.

Status: The draft revision of RP 2057 passed FCD ballot on 2018-02-09 with 5 comments to resolve. The document author has migrated the document to HTML and plans to generate code directly from the SMPTE-RA data (to ensure consistency).

DG: ST 2117-10 mapping ST 2117-1 into MXF

Current project:

ST2117-10- Mapping ST 2117-1 (VC-6) into the MXF Generic Container

Status: An ST Audit package has been prepared.

DG: Amendment to ST 2019-4:2016 VC-3 Mapping to MXF Generic Container

Current project:

Amendment: ST 2019-4:2016 - Mapping VC-3 Coding Units into the MXF Generic Container

This project will add support to ST 2019-4: 2016 for mapping a VC-3 bitstream carrying an Alpha channel into MXF, using the pre-defined HD raster profiles. There is a [related project](#) in the Essence TC.

Status: The document is published, and the project will be closed.

DG: ST 2073-10 mapping ST 2073 into MXF

Current project:

Revision ST 2073-10 - Mapping VC-5 Video Essence into the MXF Generic Container

Current version omits capabilities from VC-5 documents published after ST 2073-10 was published

Status: Work on ST 2073-10 revision is on hold awaiting related work on IMF Application VC-5 in 35PM reaching Public Committee Draft.

DG: TLX and TLC MXF mapping

Status: The DG has held 2 meetings in the last quarter. It is not planning a Public CD for these documents.

Current Projects:

ST 2120-4 - TLX KLV Encoding and MXF Mapping

TLX is Extensible Time Label, ST 2120 parts 1-3 that have just completed FCD ballot in this [TC-32NF DG](#). This document defines TLX-KLV elements in accordance with 377-1 to assure useability within MXF. The DG does not want a PCD phase for this document.

Status: There is no working draft yet as it is dependent on mapping TLX components into “TLC”, a more generic structure; see the next project below. It is also waiting for ST 2120-2 in TC-32NF to stabilize.

ST 2134: Descriptive Metadata Scheme for Compatible Time Labels (TLC)

Specify an architecture to support multiple schemes for time labels and for collections of time labels that is compatible with MXF and KLV and permits the representation and serialization of these labels in MXF, KLV, XML and JSON. Specify at least one such scheme (besides TLX).

Status: FCD ballot of ST 2134 will close 2024-06-17. All Universal Label issues have been resolved.

DG: ST 2131 - Mapping ADM to MXF

ADM = Audio Definition Model. Define a means of mapping audio metadata RIFF chunks to MXF with specific consideration of the requirements related to ADM metadata – mapping ST 2067-204 to MXF in the same way that ST 2127 maps ST 2067-203 into MXF. There has been close collaboration & overlap with “35PM DG IMF Audio with Metadata”.

Status: Public CD comment period has closed (on Github [here](#), ST 2131 + MXF & WAV sample files). The DG is planning a meeting to prepare the FCD ballot package.

WG: MXF-related Documents Maintenance

Formed at the 2021-08 meeting to manage maintenance of MXF documents.

Revision-ST-381-3-AVC into MXF Generic Container

Status: Revision of ST 381-3:2017 AVC Mapping into MXF GC completed pre-FCD-ballot review and will proceed to FCD ballot.

DG: Revision of ST 436-1 MXF Mappings for VI Lines and Ancillary Data Packets

Update the normative references and make any additional editorial adjustments required.

Status: Some changes have been incorporated. A meeting of the DG will be called to discuss readiness for FCD.

DG: Mapping DPX files into the MXF Generic Container

- Project Scope: Specify mapping of a sequence of DPX pictures as defined by SMPTE ST 268-1 and SMPTE ST 268-2 into the MXF Generic Container. DPX sequence handling could be simpler if wrapped into a container and MXF is the container of choice. MXF+DPX solves many issues for both standards.

Status: The group is making progress, with monthly meetings. The next calls (2024-07-03, 2024-08-01) will focus on UL definitions and application issues / special cases.

WG: Archive Exchange Format (AXF)

This Working Group (31FS-30) has defined an archive format that will promote interoperability between all forms of archive media.

Published document:

ST 2034-1 - Archive eXchange Format (AXF) - Part 1: Structure & Semantics (Rev. 1 published 2017)

Part 1 has also been published by ISO as a Publicly Available Specification, ISO/IEC DIS 12034-1.

Status: The Working Group meets weekly.

Current projects:

Revision: ST 2034-1 - Archive eXchange Format (AXF) — Part 1: Structure & Semantics

This part creates “Wrapped” AXF Objects. Scope: Revise ST 2034-1 to correct syntax errors in XSD file, edit text document to support XSD changes, prepare a readme file to accompany the XSD file. It was intended to remove UML diagrams from the text document, but a means has been found to edit them.

Status: No major progress in last quarter (focus has been on Open-Source project). The document is awaiting update of XSD File to match text & update of UML diagrams.

ST 2034-2 - Archive eXchange Format (AXF) - Part 2: External Uses of XML Schema

Part 2 covers the use of AXF Structures in “Unwrapped” form, enabling aggregation of files into a “Bundle”. It is useful in workflows. The schema can serve as a manifest, and it can apply hierarchical structure to files. It is intended for use from file capture on set through to archive input. There was a strong end-user demand for this technique that gathers metadata as material passes along the workflow. Use of IMF metadata is being considered to avoid reinvention.

Status: The WG has studied workflows to include in the consideration of requirements. A conceptual model has been completed. 49 Use Cases have been identified and have led to revisions to ST 2034-1; Use Cases are being modeled.

AXFlib – Open-Source Toolkit for AXF

Availability of Open-Source Code should increase AXF Traction - Small Archives & Libraries can’t afford large-scale systems, but they are interested in applying AXF.

Wider availability of AXF systems helps large vendors, too; it increases confidence of long-term AXF support. It helps assure recoverability of large investments in libraries.

Issues such as ownership & licensing need to be decided (and could form a model for SMPTE)

Status: Open-Source Code for some key services in Part 1 is being developed. Planned initial functions are Presentations, Unwrapper, Validation Tools, Wrapper, Selectively pull files out, Metadata reader for AXF Objects. AXF tools will be developed. Copyright and licensing issues are being considered.

An AXF repo (currently private, will be public when code is satisfactory) has been set up on SMPTE GitHub site.

DG: JSON Representation of SMPTE Registered Data (RegJSON)

Specify an isomorphic (reversible) mapping of SMPTE metadata to JSON, following the approach of defining mapping rules and normative schemas as employed for ST 2001 XML Representation of SMPTE Registered Data (Reg-XML). The public CD process will be used.

ST 2135 JSON Representation of SMPTE Registered Data

Status: The group meets monthly. It has defined a working methodology of incrementally defining rules and is building up assets as part of the work (sample files, drafts, rule candidates).



DG: Constrained DPX for HDR

Published documents:

ST 268-2 - Constrained Application of Digital Moving-Picture Exchange (DPX) Format for High Dynamic Range (including Amendment 1, also published)

ST 268-3 Reference Materials for DPX V2.0 HDR Implementations

Current projects:

Revision RP 268-3 - Reference Materials for DPX V2.0 HDR Implementations

Project scope: A revision project has been initiated to support the newly-defined FP16 format from the ST 268-2 revision.

Status: The DG is in the process of modifying the reference software accordingly (including changes for better memory efficiency). Once the software is known to be working, new FP16 example images will be added. A related item: IANA has been contacted to update the image/dpx mime type.

Network and Facilities Architecture Committee (32NF) Chairs: levgen Kostiukevych and Bruce Devlin

The application of the General Scope as it applies to definition and control of elements supporting the infrastructures of content production and distribution facilities, including file management, transfer protocols, time labelling of essence, synchronization of systems, switching mechanisms, and physical networks that are both internal and external to the facility excluding unique final distribution methods.

WG: SDI Interfaces

The Working Group (32NF40) scope is:

Develop and maintain SMPTE documents related to electrical and optical SDI interfaces, including SDI, HD-SDI, and Ultra HD-SDI interfaces. Provide input on one- and five-year reviews, revise existing documents as directed, and develop new documents when needed.

NOTE: The work of WG-32NF70 on UHD SDI interfaces has been merged into this group and the scope has been updated.

Current Projects:

Revision ST 2081-1: 6Gb/s Signal/Data Serial Interface – Electrical

Minor revision including updated references.

Revision ST 2082-1: 12Gb/s Signal/Data Serial Interface – Electrical

Minor revision including updated references.

Status for both: ST 2081-1 and ST 2082-1 completed ST Audit. Documents reviewed for publication with suggested editorial changes. Members of the TC with knowledge of these standards are requested to review the suggested changes.

WG: Video Over IP

This Working Group (32NF60) handles projects related to IP transport of media.

DG: SMPTE 2110 suite - Professional Media over Managed IP Networks

This group is responsible for a suite of standards specifying the carriage, synchronization and description of separate elementary essence streams over IP for the purpose of live production and facility interconnects.

Published documents:

ST 2110-10 - System Timing and Definitions

ST 2110-20 - Uncompressed Active Video

ST 2110-21 - Traffic Shaping and Delivery Timing for Video

ST 2110-22 - Constant Bit Rate Compressed Video

RP 2110-23 - Single Video Essence Transport over Multiple ST 2110-20 Streams

RP 2110-24 – Standard Definition Video in ST 2110

RP 2110-25 – Measurement Practices (related to ST 2110 video, audio, ancillary data streams)

ST 2110-30 - PCM Digital Audio

ST 2110-31 - AES3 Transparent Transport

ST 2110-40 - SMPTE ST 291-1 Ancillary Data

ST 2110-41 – Fast Metadata eXpress (FMX)

ST 2110-43 – Timed Text Markup Language for Captions and Subtitles

Status of DG: Revisions to parts 10, 20, 21, 22, 24, 31, 40 were published over the last year as well as publication of new document RP 2110-25.

Current projects:

Revision: ST 2110-40 - SMPTE ST 291-1 Ancillary Data

Errors were discovered in SDP entries in the currently published version, caused by it being published in 2023 rather than the anticipated 2022.

Status: The document is published (retaining a 2023 date, as requested).

RP 2110-11 – SMPTE 2110 System Timing Planes

This practice will specify additional behaviors of media devices using controls available in ST 2110-10. While 2110 suite documents describe device interfaces, some additional practices are required to address inter-essence timing alignment at a system level.

Status: Regular bi-weekly meetings have resumed following a short hiatus.

Revision: ST 2110-30 – PCM Digital Audio

Scope-limited revision to update the reference to AES67-2018 to allow reference to the PICS contained in that revision of AES67. If other improvements are identified by the PICS team, they will be included.

Status: Pre-DP-vote closed 2024-03-11 with no comments.

ST 2110-41 – Fast Metadata eXpress (FMX)

An RTP Payload Format for general metadata objects. Intended for transporting any metadata that did not originate as ST 291 ancillary data. Each type of metadata needs a defining document (SMPTE or other).

Supports “tightly-bound” metadata (associated to an essence stream) as well as other metadata with no specific relationship to an essence stream.

Status: The document is published. However, an error in an Annex has been identified and the WG is discussing the best course of action – likely to be a quick revision and an advisory note. A register for ST 2110-41 Data Item Types has been set up [here](#) and a request to add a code range for IPMX was notified at the meeting with no objection.

ST 2127-2 - Mapping MGA Audio Metadata to ST 2110-41

Provide a standard for mapping Metadata-Guided Audio (MGA) Audio Metadata, as defined in SMPTE ST 2127-1, to the SMPTE ST 2110-41 Fast Metadata framework.

Status: The document is published. It also has a Data Item Type registration.

DG: RP 2110-1xx's - Protocol Implementation Conformance Statements (PICS's) for ST 2110 suite

A PICS functions like a conformance checklist that implementers can complete. Each PICS document is numbered 100 greater than the document it applies to – e.g. RP 2110-110 applies to ST 2110-10. The group provided feedback to the 2110 DG which was processed as late comments in the one-year-review versions of these documents.

Status: Parts 110, 120, 121, 122 closed FCD ballot 2023-06 with no comments and were automatically elevated to DP status. FCD ballot of parts 124, 131, 140, 143 closed 2023-11-29 with 4,3,3,0 comments respectively. However, a comment about using dated references vs undated references has held up progress on these documents.

WG: Time Labeling and Synchronization

This Working Group (32NF80) was established to handle projects for next-generation synchronization of systems using packetized networks and time labeling of essence.

Business impact of WG 32NF80 work items: Network-based facility synchronization and new functionalities for time labeling.

Published documents:

ST 2059-1 - Generation and Alignment of Interface Signals to the SMPTE Epoch

ST 2059-2 - SMPTE Profile for Use of IEEE-1588 Precision Time Protocol in Professional Broadcast Applications

EG 2059-10 - Introduction to the New Synchronization System (revision published in 2023)

RP 2059-15 - YANG Data Model for ST 2059-2 PTP Device Monitoring in Professional Broadcast Applications

Current DGs and projects:

DG: ST 2059 Suite Revisions

The DG meets bi-weekly and currently has the following project:

Revision: ST 2059-2 - SMPTE Profile for Use of IEEE-1588 Precision Time Protocol in Professional Broadcast Applications

Investigate how ST 2059-2 could be made compatible with the 2019 version of IEEE 1588 without breaking existing implementations. Two issues have already been uncovered that impact ST 2059-2: Mixed unicast/multicast mode delay request message rate signaling and TLV messages.

Status: The remaining major issue is the SMPTE TLV. The method used to transport this TLV in the current version of ST 2059-2 is not allowed in PTP V2.1. The group is working to revise ST 2059-2 so that it defines two transport methods for the TLV:

- *SM TLV Method 1: conveyed using legacy Management messages*
- *SM TLV Method 2: attached to Announce messages*

A Public CD period is planned to permit implementations to test compatibility – target PCD start is August 2024. Next DG meeting is 2024-06-20.

DG: ST 2059 PTP Interoperability and Best Practices

The purpose is to confirm that the provisions of the standards are unambiguous, and that the technology yields the intended results. The Interop DG itself is open to all SMPTE Standards Community members, but its Testing AHG and attendance at the interop meetings is subject to signing a non-disclosure agreement and memorandum of understanding.

There have been five rounds of testing, all hosted by FOX NE&O in Houston, TX, USA:

2015-11, 2016-06, 2017-03, 2018-02, 2019-02.

Reports (where available) are on this SMPTE [website page](#).

The DG recently extended its scope to include documenting best practices.

Status: The DG will Continue looking for opportunities for small focused interops for specific standards

- YANG Model – RP 2059-15
- ST 2059 new TLV and backwards compatibility
- ST 2059 security
- Possible remote virtual events

Current Projects:

EG 2059-14: PTP Best Practices for Professional Media Over Managed IP Networks

Status: The DG has proposed a change to make this a Recommended Practice rather than an Engineering Guideline. There was no objection at the meeting. The document is taking shape.

DG: ST 2120: Extensible Time Label (TLX)

Create a basic Time Label with a defined mechanism for registration of additional fields. There is associated MXF work in this [File Systems technology committee DG](#).

Current Projects:

ST 2120-1 – Extensible Time Label – TLX Structure

ST 2120-2 – Extensible Time Label – TLX Items (includes a JSON schema element ST 2120-2a)

RP 2120-3 – Extensible Time Label – TLX Profiles (includes a JSON schema element ST 2120-3a)

Status: The group has held 5 meetings this quarter; the next meeting is 2024-07-18. The three documents above passed FCD ballot 2022-12-26.

Part 1 passed with 15 comments (including late comments) – all are addressed, 8 accepted, 7 non-responsive. The DG asked the TC whether to:

1. *reballot at FCD*
2. *proceed to pre-DP-vote review*
3. *wait for Part 2 ballot comments to be resolved*

The TC favored option 1.

Part 2 has 36 comments (11 addressed), and Part 3 has 25 comments (22 addressed). Comment resolution can proceed now that Part 1 comment resolution is complete.

WG: Data over AES3

This Working Group (32NF90) was established to handle projects that standardize AES3 carriage of data streams. These streams may be compressed audio, metadata – anything other than AES3 audio itself!

Status: A project proposal is awaited to restart development of ST 2041-4 – MPEG H Data in AES3.

SG: Security in SMPTE ST 2059

This Study Group investigates vulnerabilities in ST 2059 systems, both malicious and accidental. The group has decided to issue limited-scope incremental reports, whilst collecting topics (in a “backlog”) for future reports.

Published Reports:

Version 1 of the report is published, [ER 1004](#). It focused on the Threat Landscape.

Version 2 that focuses on threat detection and mitigation strategies is published, [ER 1009](#).

Status: This SG has been put on hiatus following the publication of its version 2 report.

The group has not been closed, as it is possible that there may be a 3rd report on new security features introduced in IEEE 1588:2019 once the best practice on secure key exchange methods settles down and implementations of the 2019 version appear.

32NF Document Maintenance Group

This group holds bi-weekly meetings to address issues reported on GitHub and to make the process easier to use. It also works on one-year and five-year document reviews. There are 6 GitHub repos, and more are needed:

Status: There are 111 documents in

<i>ST 299-1</i> GitHub	<i>ST 2022-1</i> GitHub	<i>ST 2059-2</i> GitHub	<i>ST 2110-10</i> GitHub
<i>RP 2110-23</i> GitHub	<i>ST 2110-30</i> GitHub		

the master list. Of those, 45 documents are left for review. Volunteers, please! The group has requested an “umbrella repo” for all IP Networking and SDI issues and the best way to implement this is still being considered. A list of tasks for WG 32NF60 was presented.

Other TC-32NF business

There was a presentation on the new proposed project “Sync Signal Alternate Mode” that uses a USB-C interface to carry signal synchronization data and a request for participation.

Media Systems, Control and Services Committee (34CS) Chair: Karyn Reid

The application of the General Scope as it applies to the implementation of media services, methods of managing and controlling hardware devices and software systems, and the management of media workflow processes, including associated signaling and control mechanisms.

DG: UMID Resolution Protocol

This project will draft a new SMPTE standard that specifies an industry-standard method for a given UMID to be converted into the corresponding URL of its audiovisual (AV) material.

Status: There has been no progress in the last quarter as the DG Chair has focused on associated TC-30MR UMID work.

DG: BFX Suite of Documents

Published documents:

RP 2021-1: General Information and Informative Notes

ST 2021-2: Protocol

EG 2021-3: Use Cases

ST 2021-4: Schema Documentation

RP 2021-5: Ad-ID / EIDR in BFX

RP 2021-6: BFX SDK Documentation

RP 2021-9: Implementing BFX

BFX is an XML-based system that standardizes exchange of Schedule, As-run, Content Transfer instructions, Content-related metadata, and Agency instructions.

BFX incremental development - New features are added to the suite at regular intervals, and these are batched into versions using a numeric version number – current published version is BFX 8.1.

Status: The group has completed work to assemble all BFX document elements from v 1.0 to 8.1 into a GitHub repo for easy access by implementers.

It anticipates working on BFX 9.0 when there is a critical mass of new items.

SG: Required Application Protocol Standards for IP-Based Media Production

This group will explore prospective Media Industry layering models and standards requirements for interoperability of production applications running on IP-based media networks.

Status: The SG report was reviewed in the TC and comments were submitted. The SG's response to the comments has been requested – a reminder will be sent.

DG: Media Microservices

This group has been managing Microservices projects submitted to SMPTE from the Open Services Alliance, OSA. In the last quarter, the OSA has been merged into the SMPTE RIS activity – Rapid Industry Solutions.

Status: Topics for future work are being developed in RIS-OSA. Currently they are: Best Practices for Live Stream Distribution, Global Service Repository.

Projects currently underway:

STxxxx: Catena

This will be a suite of documents defining the Catena control system and comprising parts on Interface, Security, Architecture, Orchestration (perhaps more).

Status: Proceeding well with bi-weekly meetings. The interface document is undergoing some final clean-up and a SMPTE GitHub site will be stood up.

ST 2125 – IMF Registration Service API

This project facilitates the use of IMF packages.

Status: Issued as public CD document [on this page](#). The DG has decided to revise the Public CD and submit the revision for a second public CD period. The DG believes it can change JSON Schema to an informative reference, collect updates from document editor, and then proceed to FCD.

ST 2126 – Microservices Status Reporting and logging

This project creates a standardized approach to implement status reporting to overcome the problem of multiple proprietary and non-interoperable protocols.

Status: Issued as public CD document [on this page](#) (comment period now closed). It now includes terms harmonized with the terminology project and was at FCD ballot during the meeting, closing 2024-06-07. Update: The ballot passed with 7 comments to be resolved.

Media Microservices Terminology

Provides definitions for terminology used in the other Microservices documents.

Status: This project is proceeding as an online vocabulary resource on the SMPTE website.

ST 2133 - Job Processing Architecture

Aims to overcome variations in existing Job Processing Architectures that cause interoperability problems.

Status: In pre-FCD review, closing 2024-06-06. Update: There were no comments.

Media Packaging and Interchange Committee (35PM) Chairs: Raymond Yeung and JoAnne Kim

The application of the General Scope as it applies to the packaging of media elements, to facilitate interchange and interoperability of formats within specific integrated application ecosystems in the professional fields of media creation, production, postproduction archiving and related topics.

Interoperable Mastering Format (IMF)

IMF is a file-based framework designed to support multiple high-quality content versions of a finished work destined for distribution channels worldwide. It facilitates management and processing of these content versions, including playback, validation and transformation to the various master formats used by each distribution channel. IMF is intended for international use in professional applications.

Business Impact: Interchange of file-based masters for current and next generation audiovisual content, including wide-color gamut (WCG), high-dynamic range (HDR) imaging and immersive audio.

DG (35PM-50): IMF Document Maintenance

Issues are continuously collected and discussed in SMPTE 35PM GitHub repository - <https://github.com/SMPTE?q=2067> - and members contribute to revision work, for both bugs and improvement requests.

Status: The DG does not currently have any documents in maintenance.

Published Interoperable Mastering Format documents:

- ST 2067-2 - Core Constraints
- ST 2067-3 - Composition Playlist
- ST 2067-5 - Essence Component
- ST 2067-8 - Common Audio Labels
- ST 2067-9 - Sidecar Composition Map
- ST 2067-20 - Application #2
- ST 2067-21 - Application #2E
- ST 2067-30 - Application #3
- ST 2067-40 - Application #4 Cinema Mezzanine
- ST 2067-50 - Application #5 ACES
- ST 2067-60 - Application #6 UHD TV Program Workflow (AVC)
- RDD 45 - Application ProRes
- RDD 59-1 - Application Constraint DPP (ProRes)
- ST 2067-100 - Output Profile List
- ST 2067-101 - Output Profile List - Common Image Definitions and Macros

ST 2067-102 - Output Profile List - Common Image Pixel Color Schemes

ST 2067-103 - Output Profile List - Common Audio Definition and Macros

ST 2067-200 - Dynamic Metadata for Color Volume Transform (DMCVT) Plug-in

ST 2067-201 - Immersive Audio Bitstream Level 0 Plug-in

ST 2067-202 - Isochronous Stream of XML Documents (ISXD) Plugin

ST 2067-203 - IMF Audio with Frame-based S-ADM Metadata Plug-in

DG: IMF Output Profile List

This group created parts 100, 101, 102, 103 of the IMF suite. A decision has been made to convert to the HTML document development workflow for the four projects below.

Status: The DG has been developing the Working Draft documents.

Current projects:

Revision: ST 2067-101-OPL-Image Macros

Revision to clarify the handling of images that are: i) chroma-subsampled; ii) Interlaced; and iii) stereoscopic.

This project also adds new common image processing macros to ST 2067-101:2018 including 3x3 matrix, 1D LUT (Look Up Table), named transfer function decode/encode and named color space conversion.

ST 2067-104 – OPL Composite and Blend Macros

This new document develops the processing macros for image composite and blending between a foreground and a background plate with an alpha (channel) image to control the operation. The macros are part of the IMF OPL framework defined by ST 2067-100.

ST 2067-105 – OPL Output Macros

This new document develops the image and audio output macros for the IMF OPL framework defined by ST 2067-100. This project will add a set of output macros based on the AMWA AS-11 in OPL report (SMPTE ER 1006) and IAB in OPL report (SMPTE ER 1005) including the generation of ISO BMFF (QuickTime), TTML, AMWA AS-11, PCM essence in ISO BMFF (QuickTime) and immersive audio in BWF+ADM files.

Status: Completion will follow Parts 101 and 104.

ST 2067-106 – OPL EssenceType Transform Macros

This new document develops the essence type transform macros for timed-text rasterization and immersive audio bitstream (IAB) conversion. The macros are part of the IMF OPL framework defined by ST 2067-100.

Status: Completion will follow Parts 101 and 104.

DG: IMF Application VC-3

This group documents an IMF Application for VC-3 image essence as specified by SMPTE ST 2019-1.

Current project:

ST 2067-70 - IMF Application of ST 2019-1 (VC-3)

To define a mastering workflow using VC-3 family of codecs in IMF, focused on broadcast post-production. A public CD release is intended.

Status: The document was posted as a PCD on [GitHub](#) (comment period now closed). It has been well publicized. A comment was received at pre-DP-vote review, and it has been accepted. A DP vote will be posted.

DG: IMF Application VC-5

IMF Application for VC-5 based on ST 2073-10 MXF Wrapper. This group documents an IMF Application for VC-5 based on SMPTE ST 2073-10 MXF Wrapper. The DG holds bi-weekly meetings.

Current Project:

ST 2067-72 - IMF Application VC-5

Completion of an IMF Application for VC-5 image essence limited to the capabilities of the VC-5 MXF wrapper specified in SMPTE ST 2073-10.

Status: Public CD release has been approved.

DG: IMF Application VC-6

This group documents an IMF application for the video codec VC-6 specified by the SMPTE ST 2117 document suite.

Current Project:

ST 2067-71 - IMF Application VC-6

Define a simple mapping for VC-6 to enable it to be used in IMF workflows.

Status: The document completed its pre-DP-vote review 2024-05-21 with 3 comments that have been resolved. A DP vote will be initiated.

DG: IMF Audio with Metadata

This group documents the use of plug-in track for the IMF packaging framework to support audio essence with associated metadata.

Current projects:

ST 2067-203 - IMF Audio with Frame-based S-ADM Metadata Plug-in

Draft a standard for an IMF Plug-in for adding MGA signals with S-ADM metadata as Virtual Tracks to IMF compositions.

Status: Published.

ST 2067-204 IMF Audio with ADM Metadata Plug-in

Develop a standard for an Interoperable Master Format (IMF) plug-in to allow ADM (Audio Definition Model, ITU-R BS.2076) metadata to be carried alongside PCM essence in IMF compositions, where the Track Files used are Audio Track Files (SMPTE ST 2067-2) augmented by ADM metadata.

Status: ST 2067-204 is posted for Public CD review [here](#). A joint meeting with the ST 2131 group in TC-31FS is planned, as this project is closely bound with that one. FCD ballot will follow.

DG: IMF Aux Image Sequence Plug-in

This group documents the use of plug-in track for the IMF packaging framework to support additional image sequences beyond the main image virtual track.

Current Project:

ST 2067-205 IMF Auxiliary Image Sequence Plug-in

Specify Auxiliary Image Sequence Track File, Virtual Track for CPL, and any additional constraints. Sign language is an example use case.

Status: The source documents from the DPP are available and the DG expects to make progress on the WD in the next quarter.

DG: Event-based Text-based Data Plug-in

This group documents the use of plug-in tracks for the IMF packaging framework to support timed-based textual metadata. Such metadata presents event-based metadata in XML format.

Status: The first DG meeting will be held, probably after the IMF Audio with Metadata DG meeting. The initial WD's will be developed using the new html-publishing tool.

Current Projects:

ST 2067-206 IMF Event-based, Text-based Metadata Plug-in

Develop a standard for an Interoperable Master Format (IMF) plug-in to add event-based, text-based metadata to IMF Compositions, including an optional XML/JSON scheme for generic event-based metadata.

ST 2067-207 IMF Video Viewports Metadata Plug-in

Develop a standard that extends the “Interoperable Master Format — Event-based, Text-based Metadata Plug-in” for use in adding video viewports metadata (similar to “pan and scan” metadata) to IMF Compositions.

ST 2067- 4 IMF - Virtual Track Fingerprint

This project is managed under the TC by individuals without a group. The scope is to define a method for computing a unique identifier for the contents of a virtual track in an IMF Composition Playlist.

Status: A presentation was given, showing the application of this technique. The TC Chairs will request a GitHub repo and PCD for this document.

SMPTE Standards Publications in the Last Quarter*Includes Revisions and Amendments*

SMPTE introduced a new policy at the beginning of 2024 of making its standards available free-of-charge to SMPTE members. To support this, the standards (along with conference papers and the Motion Imaging Journal) are available on smpte.org – go to <https://my.smpte.org/s/>

10E Essence**27C Cinema**

ST 429-18:2023 D-Cinema Packaging — Immersive Audio Track File	Published 2024-04-03
ST 430-12:2023 D-Cinema Operations — FSK Synchronization Signal	Published 2024-04-18
ST 430-1:2023 D-Cinema Operations — Key Delivery Message	Published 2024-04-26
ST 430-5:2023 D-Cinema Operations — Security Log Event Class and Constraint	Published 2024-04-08

30MR Metadata & Registers

ST 2123:2024-05 SMPTE Metadata Registers (Jalapino)	Published 2024-05-09
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31FS File Formats & Systems

ST 2019-4:2016 Amd1:2024 Mapping VC-3 Coding Units into the MXF Generic Container — Amendment 1	Published 2024-05-02
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32NF Network & Facilities Architecture

ST 2110-41-2024 Professional Media over Managed IP Networks: Fast Metadata Framework	Published 2024-05-01
ST 2127-2-2024 Mapping MGA Audio Metadata to ST 2110-41	Published 2024-05-01

34CS Media Systems, Control & Services**35PM Media Packaging & Interchange****SMPTE Public Committee Drafts***Link to current PCD page [here](#)*

Annex: Notes on this Report and the SMPTE Standards Process

Any trademarks appearing herein are the property of their respective owners.

SMPTE Technology Committees (TCs) are tasked with the development and ongoing maintenance of engineering documents concerning Television, Broadband, Cinema. TCs are set up by the Standards Vice President (SVP) and are overseen by the Standards Committee (ST).

The standards process operates under the [SMPTE Standards Operations Manual \(OM\)](#). All participants must abide by these provisions. A suite of [Administrative Guidelines](#) support the Standards OM.

Within Technology Committees, there may also be Working Groups (**WGs**), Study Groups (**SGs**) Drafting Groups (**DGs**) and Ad-Hoc Groups (**AHGs**).

The 'Standards Community' (**SC**) is a "parent group" that encompasses all Technology Committees. Joining SC requires a Standards Participation subscription that allows members to join all TCs and sub-groups that are of interest. An SC meeting is held during each meeting round to convey information that is relevant to all TCs, such as meeting logistics and registration information.

SMPTE Document Development Process

The document stages are as follows:

WD = Working Draft **CD** = Committee Draft inc. **PCD** option for early public exposure via GitHub

FCD = Final Committee Draft (has passed FCD ballot)

DP = Draft Publication, which initiates **ST Audit** - a due-process check by the Standards Committee

SMPTE Document-Type Prefixes

ST = Standard **RP** = Recommended Practice **EG** = Engineering Guideline

OV = Overview, usually used with multipart document suites to explain the structure

RDD = Registered Disclosure Document **ER** = Engineering Report (from Study Group or Task Force)

AN = Advisory Note **AG** = Administrative Guideline

SMPTE Document-Type Suffix

Amendment = Amendment

SMPTE Document Review

The SMPTE Operations Manual calls for review of published documents:

- One Year after original publication - to check whether comments have been received during initial implementations and to revise if required
- At Five Year intervals after original publication - to check whether the provisions need to be revised

Options are as follows: Revise; Amend; Reaffirm; Stabilize; Withdraw.

A review may be conducted at any time to update specifications and/or to correct errors.

Other Notes

*This report describes each active **Project** in each TC. Occasionally, there is more than one project group working on a technology topic. In this case, those projects are grouped under a **Topic** headline.*