



SMPTE STANDARDS ECOSYSTEM

Standards Committee

Aquisition & Presentation

Essence (10E) Digital essence is central to all areas of the motion-imaging industry and the role of TC-10E is to cover the essential technologies related to content creation. These include video image representation, its capture and mastering, coding and distribution, and professional display. Beyond conventional imaging there is also activity to address tactile essence—able to offer the additional experience of motion-enabled tactile or haptic “feeling” of being at a live event. Key standards developed and maintained within 10E include UHDTV Image Parameter Values for Program Production, and a range of video compression standards: VC-1, VC-2, VC-3, and VC-5. There is also the Academy Color Encoding Specification and Academy Density Exchange for ACES device-independent color management, image interchange and long-term archiving; this and other SMPTE standards, such as the High Dynamic Range Electro-Optical Transfer Function of Mastering Reference Displays, have introduced features to support High Dynamic Range (HDR) and Wide Color Gamut (WCG) imagery. Complementary to this is a suite of standards being developed for content-dependent, dynamic metadata to enable the high-quality color volume transformation of such source content for its presentation on conventional Standard Dynamic Range (SDR) displays.

A suite of documents is being prepared to deal with the use of fixed pixel matrix reference displays; already published are standards for reference white level and chromaticity, and the measurement and calibration procedure for HDTV displays. Back at the point of acquisition, a Recommended Practice is also being developed to define the measurement procedure for assessing the colorimetric quality of lighting used in television production. Typically, 20 or more projects are active at any one time.

Introduction:

The SMPTE standards activities are conducted within a framework of Technology Committees with clearly defined scopes, their related Working Groups and Drafting Groups. The Committees are divided into three groups: content creation and representation is handled by the Essence committee; four committees address delivery applications and five infrastructure committees provide common services and structures for use across multiple applications.

Due to the rapid progress in SMPTE standards work, some of the projects mentioned in this chart will have been finalized, and new activities may have been established, at the time of publication of this chart.

Join in:

Standards facilitate interoperability of products and processes. For nearly 100 years, SMPTE has been the leader in standards for the motion imaging industry, facilitating interoperability and therefore business. Join the SMPTE standards process and participate in the development of future standards. To learn more about SMPTE Standards Committees go to <https://www.smpte.org/standards/engineering-committees>

Infrastructure & Media Management

Metadata and Registers (30MR) TC-30MR is tasked with the on-going maintenance of the metadata registers that assure consistent use of dictionaries in standards published by SMPTE and other standards development organizations. The committee also defines new registers as they are identified by stakeholders and provides a forum for other projects primarily designed to address metadata issues. As motion picture technology continues its digital evolution, dictionaries provide a fundamental tool for developing interoperable standards. Stable, reliable registers are therefore critical to the success of many existing SMPTE standards and many more to come.

File Formats and Systems (31FS) TC-31FS oversees the definition of file formats for the storage, interchange, and management of digital media, as well as mappings of essence kinds to these containers. It covers technologies such as Material Exchange Format (MXF), Digital Picture Exchange (DPX), Archive Exchange Format (AXF) and Academy Color Encoding Specification container format. Recently completed and ongoing efforts include mapping of MXF to XML; mapping of Advanced Audio Coding (AAC) essence streams to MXF; study of timecode practices in MXF; and carriage in MXF of important industry-supported content identifiers like EIDR and Ad-ID.

Network Facilities/Architecture (32NF) TC-32NF is responsible for the standards used to transport audio, video, and ancillary data. These standards include the SDI interface family, recently extended with the 6G-SDI, 12G-SDI, and multilink 10G-SDI standards to support UHDTV video formats, the ST 2022 video over IP standards, and the new ST 2059 synchronization over IP standard.

Media Systems, Control and Services (34CS) TC-34CS is focused on Media Systems, Control, and Services. To that end, the TC has two primary activities of interest at the moment. It is the home of the work on the Broadcast eXchange Format (B XF), as defined in the 2021-x suite of documents. This standard forms the basis for standardized communication between playout systems and those systems that manage the scheduling of program and advertising material. B XF 4.0 is expected to publish before the end of 2015, and the work on B XF 5.0 is already under way. 34CS is also home to the work on Media Control over IP, which defines control of media devices using standard Internet Protocol methods. This group continues to evolve the 2071-x suite of documents.

Media Packaging and Interchange (35PM) The Interoperable Master Format (IMF) is the current focus of TC-35PM under the 35PM50 Working Group. The IMF standard is a file format that allows for flexible versioning, saving just the different, unique components of a master, instead of flattened, long-play files. IMF is meant to save storage space and is for B2B (not to the consumer) for non-theatrical masters.

Delivery Applications

Film Applications (20F) TC-20F supports all aspects of film and its applications, and general audio and projection cinema presentation aspects. Four Working Groups support the committee projects: Film Production Technology, Film Laboratory Services, Audio Technology, and Theatrical Projection. The committee examines many documents for five-year reviews, and given the decline in film usage, many standards on this subject are declared Stable. However, recent committee study on methods for measuring on-screen light levels has revealed wide application in standards documents specifying conflicting measurement methods. A project is currently under way to harmonize these standards with a single measurement method.

Digital Cinema (21DC) TC-21DC documents and maintains standards related to the distribution and reproduction of content for movie theaters equipped for digital cinema playback. This includes standards for compression, encryption, marking, packaging, playout, projection, and related topics. Recently, 21DC has sent new standards to publication that provide for delivery, transfer and synchronization of auxiliary data such as immersive audio.

In addition, 21DC has been busy writing and revising standards to help the industry switch from “Interop” digital cinema delivery formats to full SMPTE standard delivery. This includes publishing a rich set of metadata that describes the contents of a DCP and updates to standards that clarify packaging and add rich metadata to Main Audio tracks. Currently, 21DC is working on revisions for subtitles and new standards for the exchange of facility information.

Television and Broadband Media (24TB) TC-24TB is an “applications” committee focused on mastered essence for television and broadband distribution, including hybrid delivery environments. The work spans all technologies, as they are adapted for television and broadband, including compression, encryption, storage, etc., in the television facility. Specific areas of work include audio/video sync measurement, closed caption transport and technology (e.g. SMPTE Timed Text), and binding of content identifiers.

Cinema Sound Systems (25CSS) TC-25CSS is addressing new standards for cinema sound quality and the interoperability of immersive sound systems in D-Cinema. The overall goal is to improve the quality, interoperability, and consistency of sound in cinemas and indoor spaces. The committee recently published reports on the current crop of immersive sound systems, an extensive report on the current state of theater B-chain frequency and temporal response, and has created a standard for a wideband digital pink noise signal.

Current work includes a recommended practice that details step-by-step procedures for measuring and calibrating the frequency response and sound pressure levels in a theater, and a multi-faceted project to create standards that will specify all aspects necessary to achieve immersive sound system interoperability in D-Cinema.

