



SMPTE “CompCine” Standards

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SMPTE

Agenda

- How I got involved with “CompCine”
- SMPTE Standards Overview
- SMPTE Stereoscopic 3D (S3D) Standards
- SMPTE “CompCine” Standards

Give it a name!

Computational
Cinematography
or
“CompCine”



Hybrid S3D or “What I did on my summer vacation”

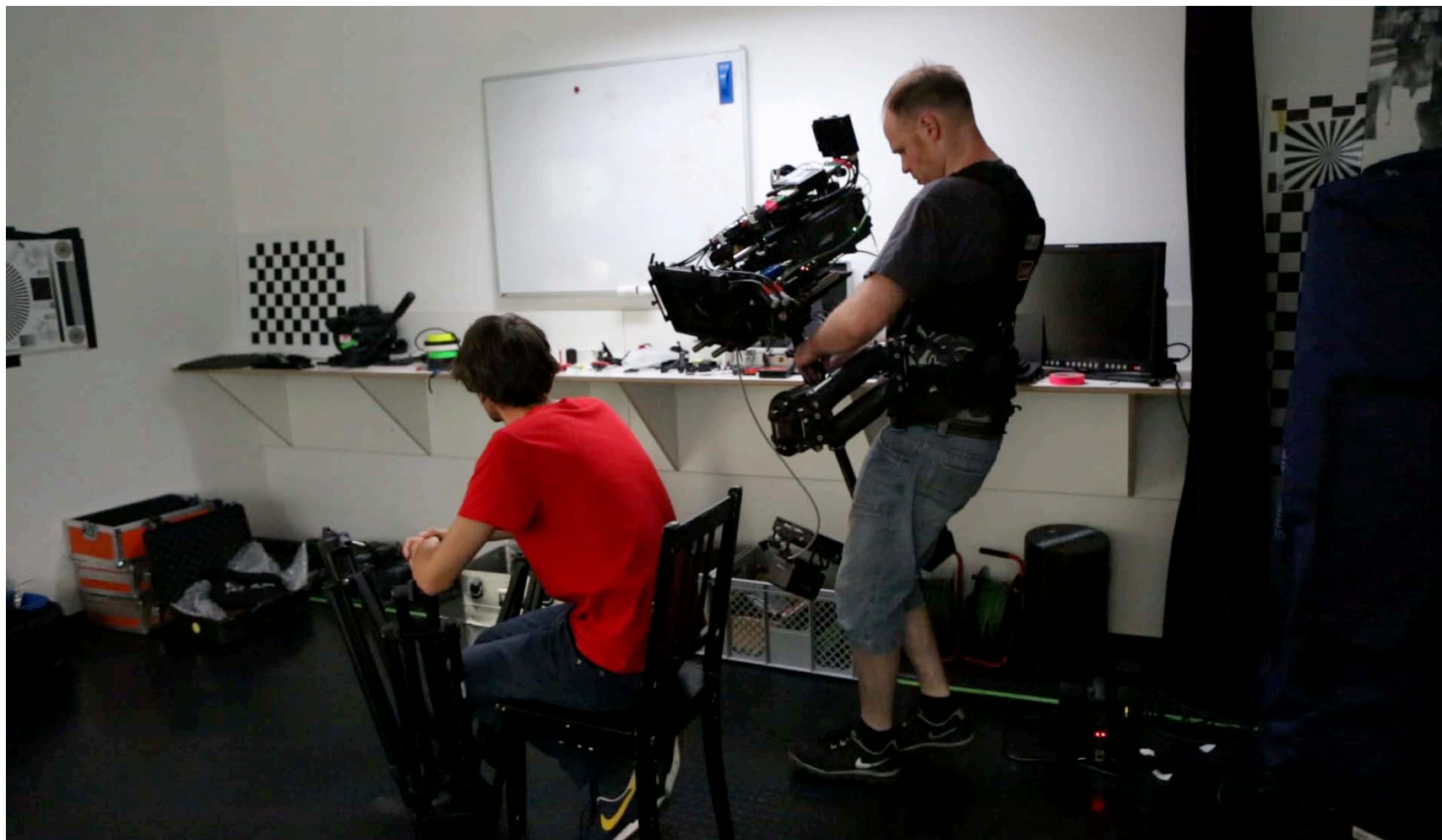
The Walt Disney Studios, Fraunhofer HHI and ARRI





“Make Believe” August 2013 Berlin







SMPTE Standards Overview

- Standards – ST
- Recommended Practice – RP
- Engineering Guidelines – EG
- Registered Disclosure Documents - RDD
- Engineering Reports – ER
- Administration Guidelines – AG
- Advisory Notes - AN

SMPTE ST 2067-102:2014

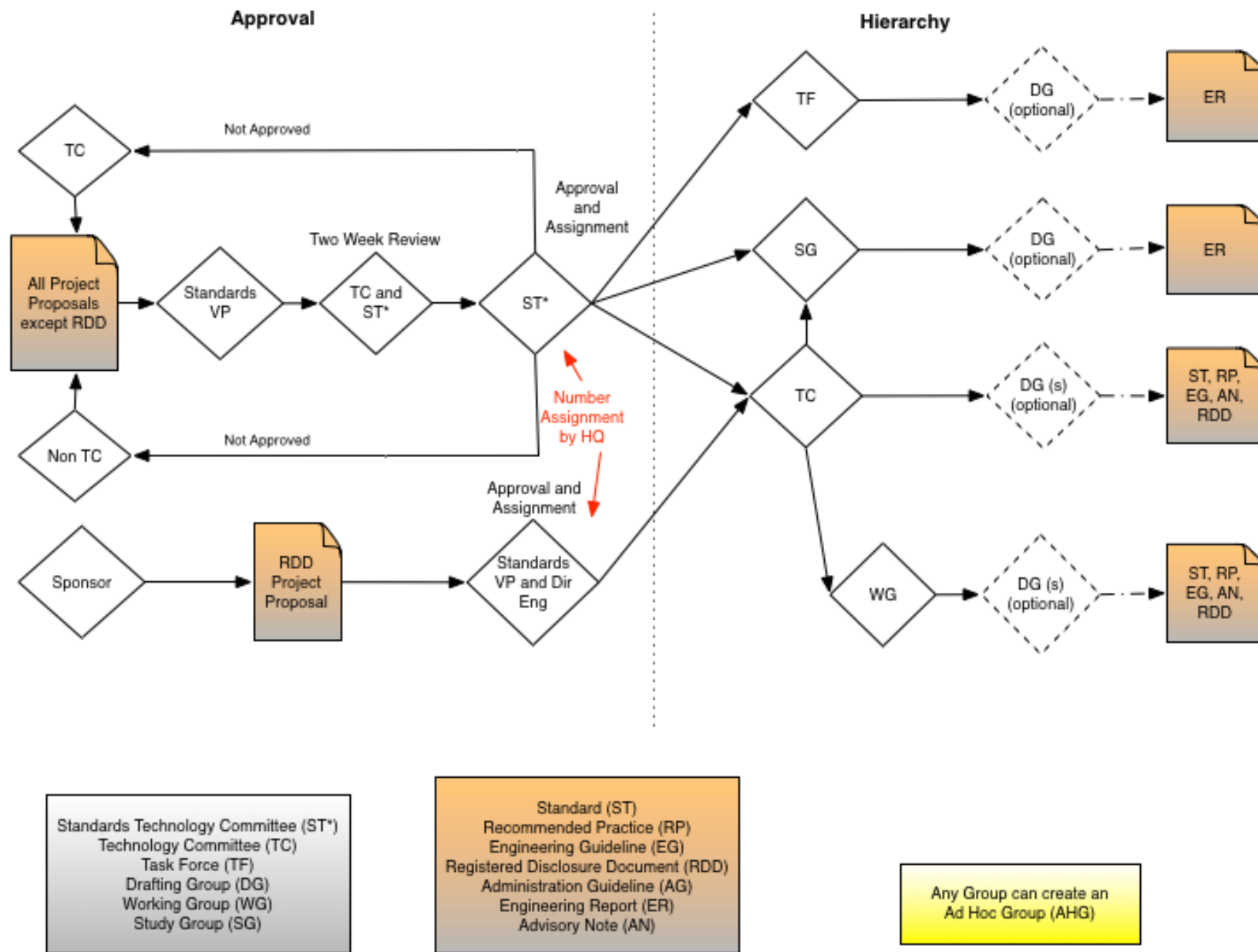
SMPTE STANDARD

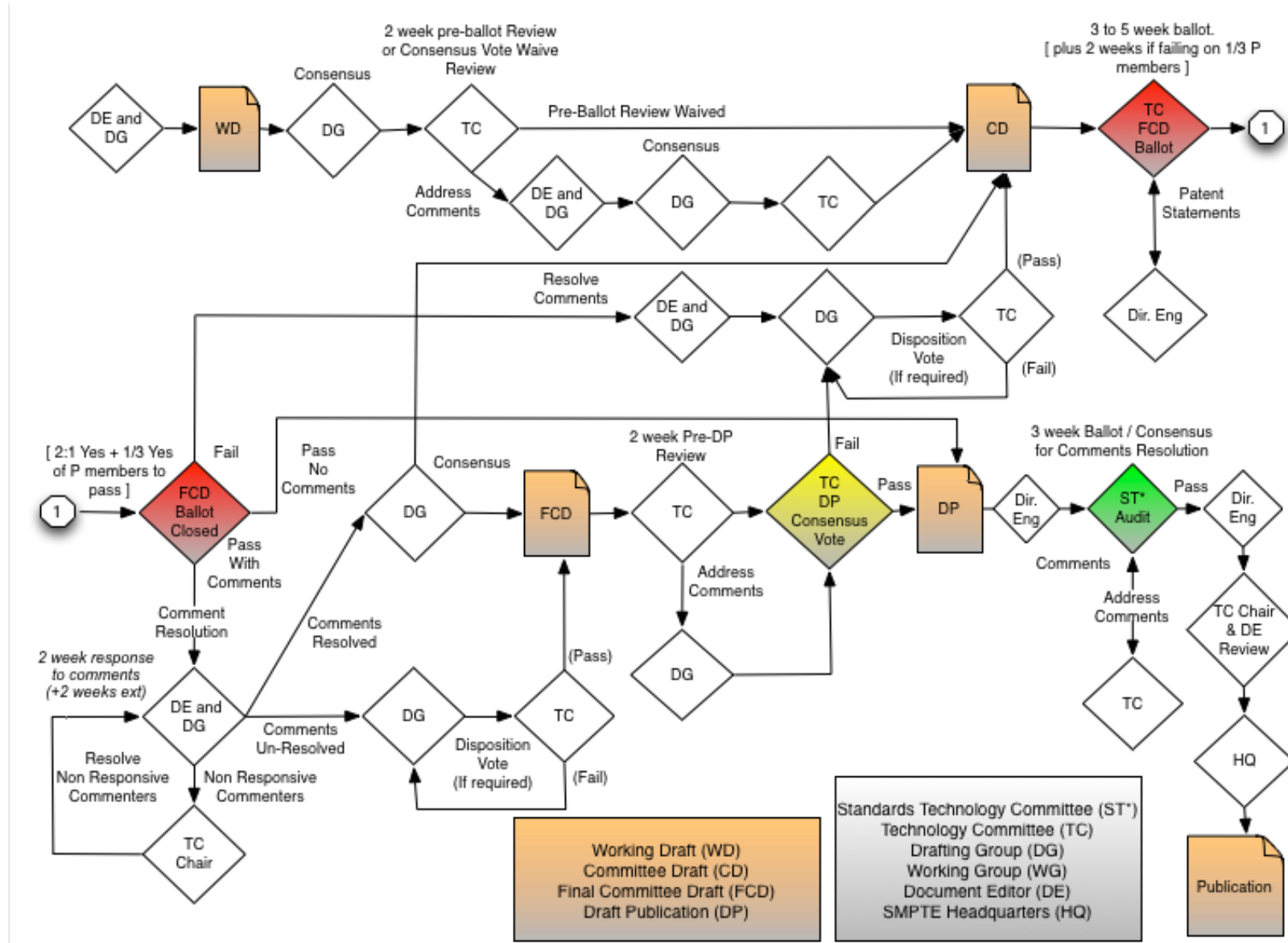
Interoperable Master Format —
Common Image Pixel Color
Schemes

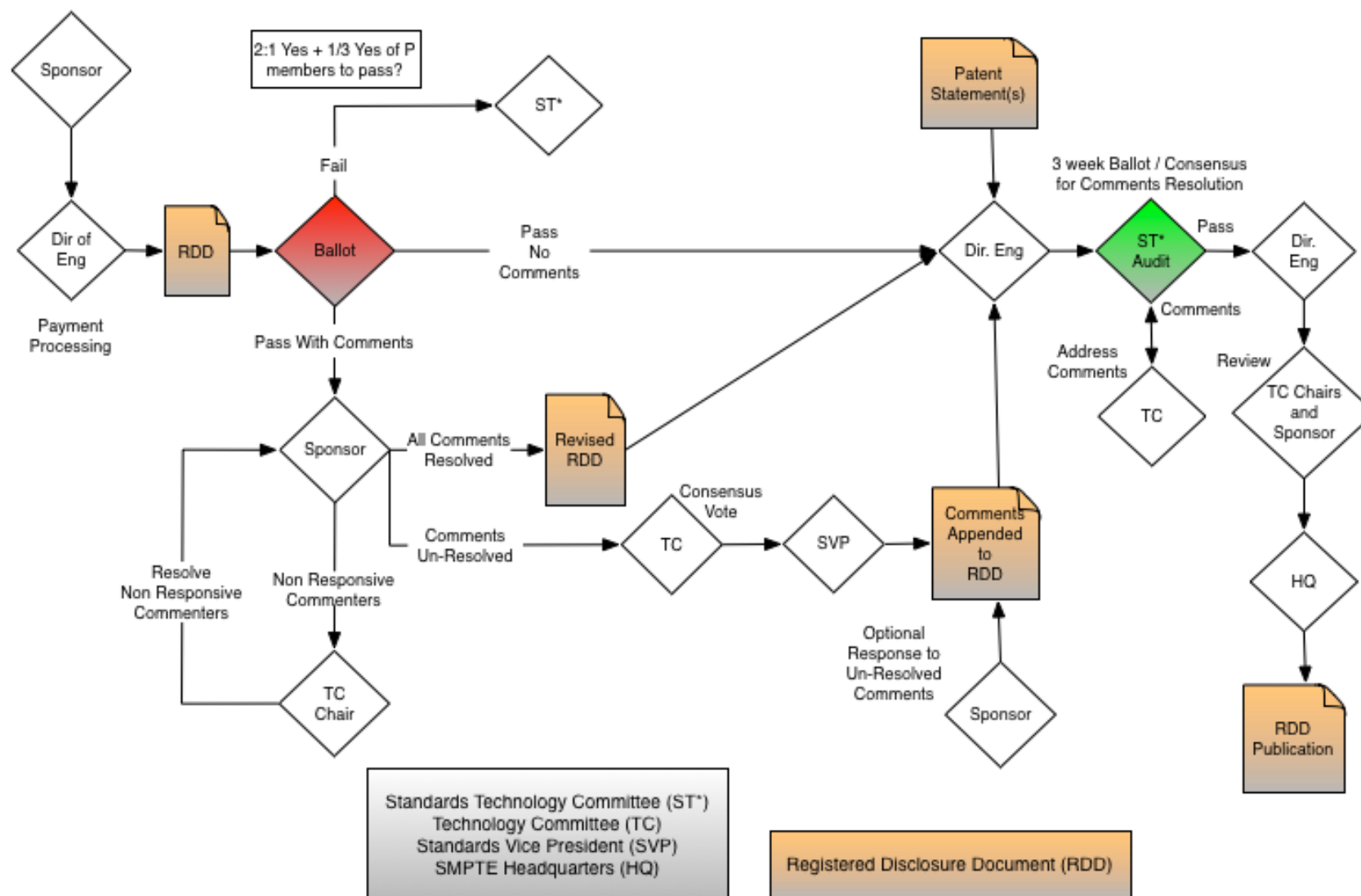


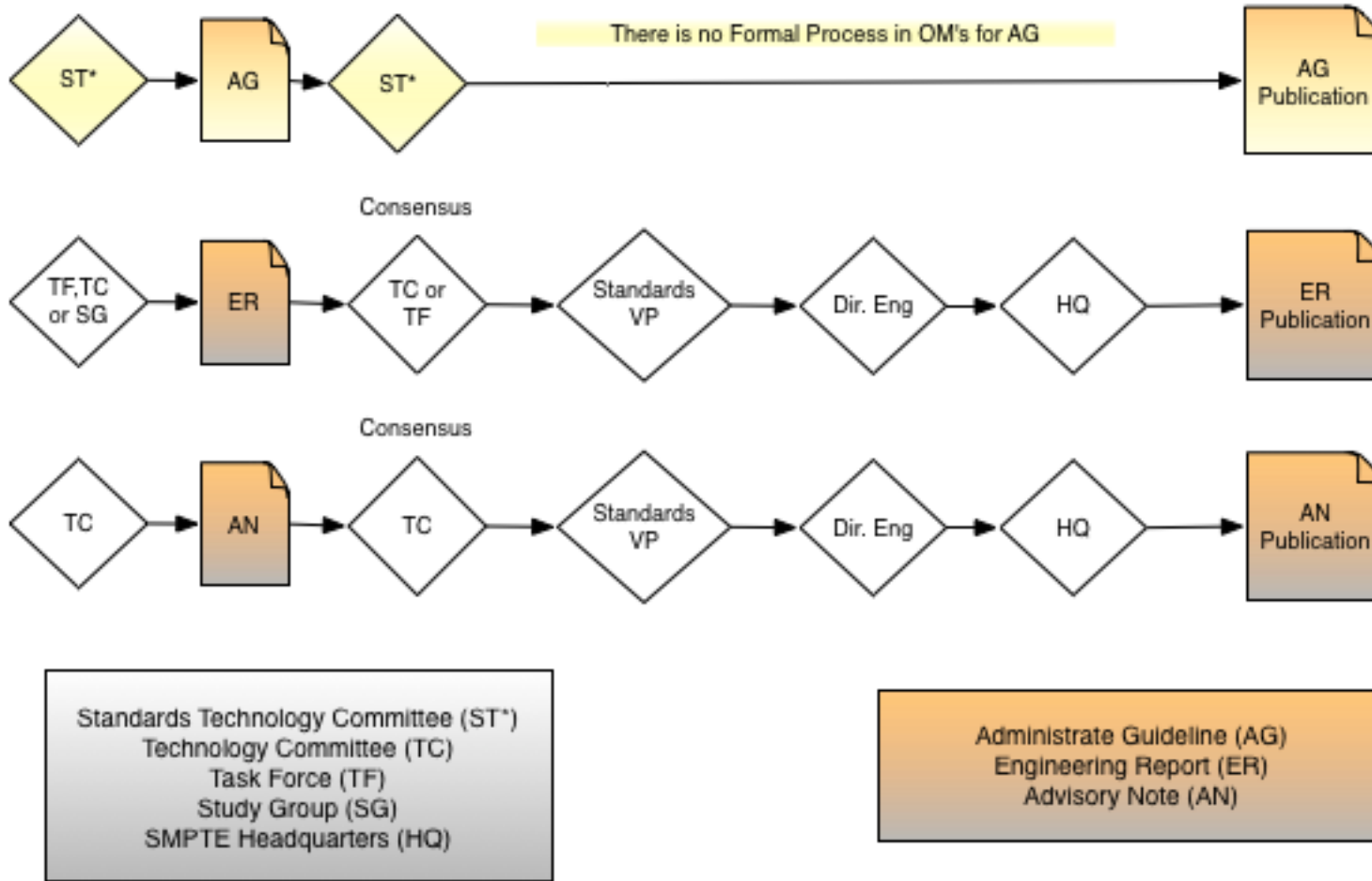
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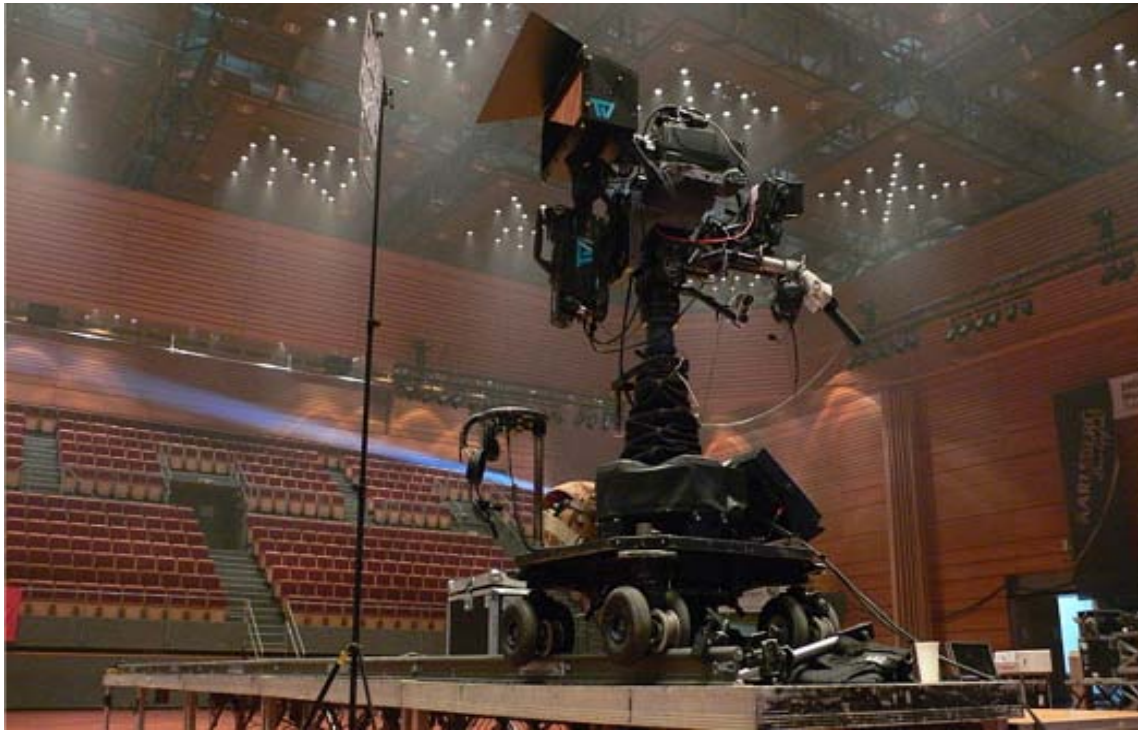








Current State of SMPTE S3D Standards



SMPTE SDI 4:2:2 10 bit Transport



S3D or Mono	Image Format	Nominal Frame Rate (Frames/sec)	HDSDI Data Mapping	HDSDI Serial Interface	Link Data Rate (nominal Gb/s)	Number of Links	Interface Data Rate (nominal Gb/s)
Mono	1280×720	24 to 60	ST 292-1	ST 292-1	1.5	1	1.5
	1920×1080	24 to 30					
	2048×1080						
S3D	1280×720	24 to 60	ST 292-2	ST 292-1	1.5	2	3
	1920×1080	24 to 30					
	2048×1080						
	1280×720	24 to 60	ST 425-2	ST 424	3	1	3
	1920×1080	24 to 30					
	2048×1080						
Mono	1920×1080	48 to 60	ST 425-1	ST 424	3	1	3
	2048×1080						
S3D	1920×1080	48 to 60	ST 425-4	ST 424	3	2	6
	2048×1080						

SMPTE SDI 4:4:4 10 bit Transport



S3D or Mono	Image Format	Nominal Frame Rate (Frames/sec)	HDSDI Data Mapping	HDSDI Serial Interface	Link Data Rate (nominal Gb/s)	Number of Links	Interface Data Rate (nominal Gb/s)
Mono	1280×720	24 to 60	ST 425-1	ST 424	3	1	3
	1920×1080	24 to 30					
	2048×1080						
S3D	1280×720	24 to 60	ST 425-4	ST 424	3	2	6
	1920×1080	24 to 30					
	2048×1080						
Mono	1920×1080	48 to 60	ST 425-5	ST 424	3	2	6
	2048×1080						
S3D	1920×1080	48 to 60	ST 425-6	ST 424	3	4	12
	2048×1080						

Disparity and Depth Maps



ST 2066 Disparity Maps

This document provides a standard for data representation of disparity maps for use in exchanges between stereoscopic 3D video production and mastering systems, and is particularly suited to live events. These disparity maps represent only horizontal disparity and thus presume that the corresponding stereoscopic image pairs have no Vertical Misalignment.

SMPTE ST 2066:2012

SMPTE STANDARD

Disparity Map Representation for Stereoscopic 3D



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ST 2087 Depth Maps

This standard provides a data representation for depth information. This information allows for simple interchange during production and post-production, and provides the essence for distribution of single-view and multi-view content. The standard specifies a 32-bit floating point representation and a 16-bit floating point representation for depth information.

SMPTE ST 2087:2016

SMPTE STANDARD

Depth Map Representation



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SMPTE “CompCine” Standards

RP 2076-1 Production Timing and Sync for S3D and Multi-Camera Array



SMPTE RP 2076-1:2016

SMPTE RECOMMENDED PRACTICE

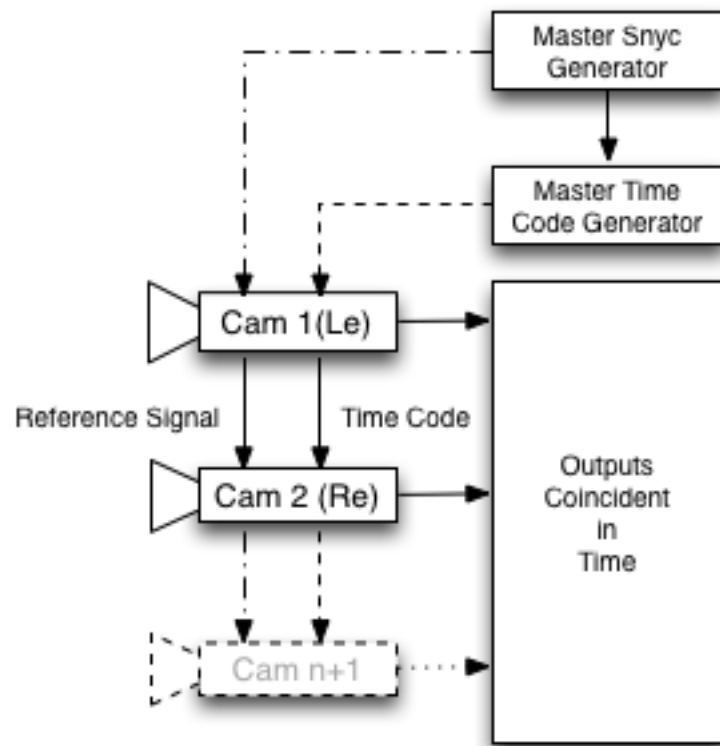
Production Timing and
Synchronization for Stereoscopic
(S3D) or Multi-Camera Array



This document specifies the synchronization of two or more cameras in a Stereoscopic (S3D) or Multi-Camera Array moving image camera systems.

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RP 2076-2 Image Identification, Alignment, Transport and System Guidance for S3D or Multi-Camera Array

This Engineering Guideline provides an overview of the identification, synchronization and transport of Stereoscopic (S3D) or Multi-Camera Array motion picture and television images over SDI transport systems.



SMPTE EG 2076-2:2016

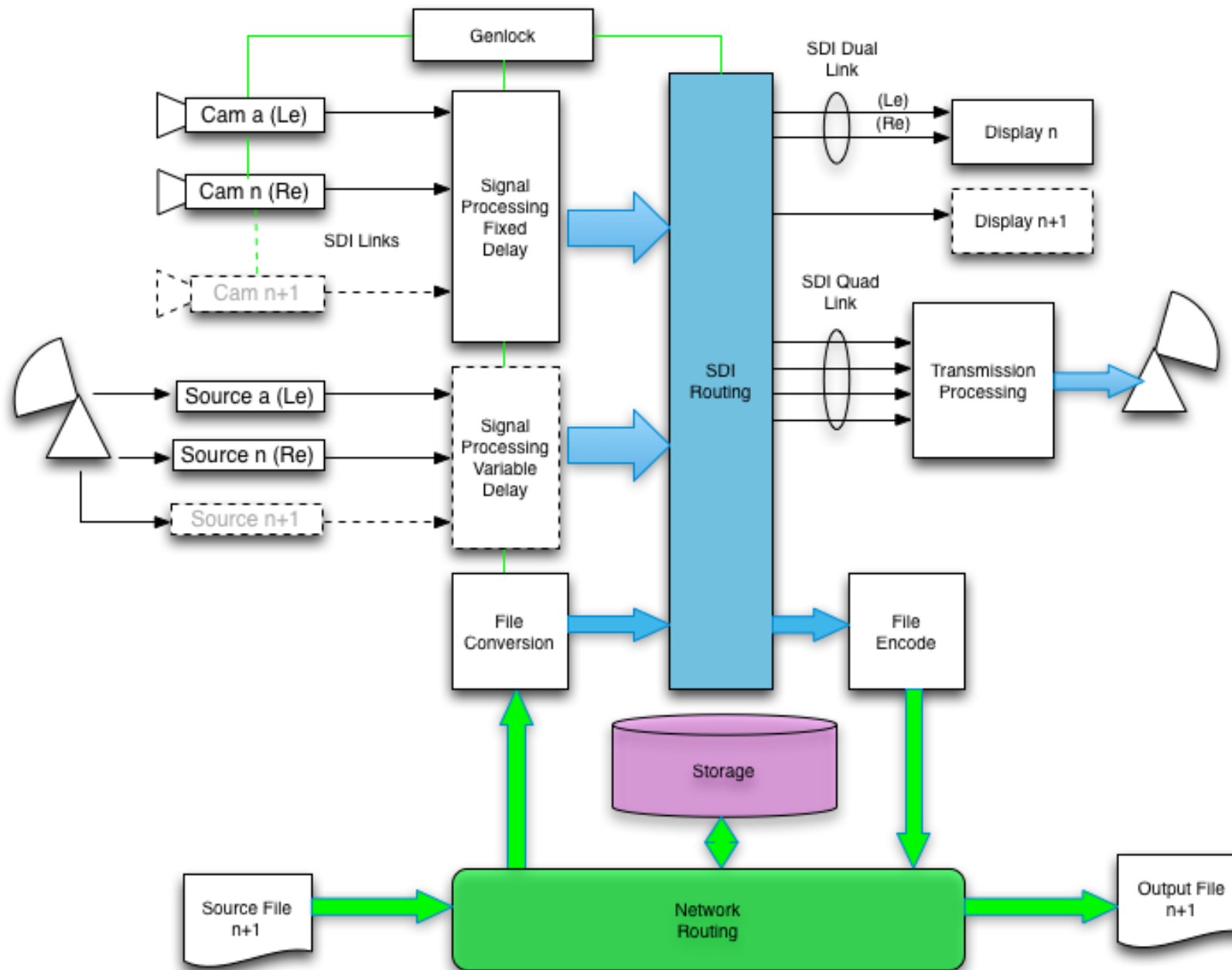
SMPTE ENGINEERING GUIDELINE

Image Identification, Alignment,
Transport and System Guidance
for Stereoscopic (S3D) or
Multi-Camera Array



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What's missing?

- Capture
 - Camera ID Metadata
 - Lens Metadata ?
 - Location Metadata
- Recording
 - High Bandwidth Recorders
 - Metadata
 - Time Labels
- Transport
 - SDI Metadata
 - SVIP Essence and Metadata



Thank you!

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